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SECOND SERIES.

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PRACTICE WITH SCIENCE.

LONDON:
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1876.

THESE EXPERIMENTS, IT IS TRUE, ARE NOT EASY, STILL THEY ARE IN THE POWER OF EVERY THINKING HUSBANDMAN. HE WHO ACCOMPLISHES BUT ONE, OF HOWEVER LIMITED APPLICATION, AND TAKES CARE TO REPORT IT FAITHFULLY, ADVANCES THE SCIENCE, AND, CONSEQUENTLY, THE PRACTICE OF AGRICULTURE, AND ACQUIRES THEREBY A RIGHT TO THE GRATITUDE OF HIS FELLOWS AND OF THOSE WHO COME AFTER. TO MAKE MANY SUCH IS BEYOND THE POWER OF MOST INDIVIDUALS, AND CANNOT BE EXPECTED. THE FIRST CARE OF ALL SOCIETIES FORMED FOR THE IMPROVEMENT OF OUR SCIENCE SHOULD BE TO PREPARE THE FORMS OF SUCH EXPERIMENTS, AND TO DISTRIBUTE THE EXECUTION OF THESE AMONG THEIR MEMBERS.

VAN THAER, *Principles of Agriculture*.

LONDON: PRINTED BY WILLIAM CLOWES AND SONS, STAMFORD STREET,
AND CHARING CROSS.

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In Reprints of the Journal all Appendix matter and, in one instance, an Article in the body of the Journal (which at the time had become obsolete), were omitted; the Roman numeral folios, however (for convenience of reference), were reprinted without alteration in the Appendix matter retained.

METEOROLOGY; IMPORTATIONS OF GRAIN; SALES OF BRITISH WHEAT; PRICES OF CORN AND OTHER PRODUCE; AGRICULTURAL STATISTICS; AND STATISTICS OF DAIRY PRODUCE.

[*The facts are derived chiefly from the Meteorological Reports of* Mr. Glaisher, *and the Returns of the* Board of Trade, *and of the* Inspector-General of Imports and Exports.]

METEOROLOGY.—1875.

First Quarter (*January, February, March*).—The period of severe cold which set in on the 21st November, 1874, ended on the 1st day of January, the mean temperature of which month was equal to 43°·4, and exceeded by 7° the average for the same month in 104 years. Since the year 1771 there have only been three Januaries of higher temperature than that of this year. On the last day of January cold weather again set in, and lasted until nearly the end of the quarter. During 33 days of February and March the direction of the wind was between N. and E. The mean temperature of February was 35°—8°·4 lower than that of January, and 3°·6 lower than the average in 104 years; in March the mean was 40°·2, and 0°·9 below the same average.

The mean temperature of the quarter was 39°·5, and 0°·8 above the average.

The fall of rain in the quarter at Greenwich was 4·4 inches, and 0·6 of an inch below the average; the amount measured in January was in excess, whereas it was below the average both in February and March. The average rainfall at the several stations of observation between latitudes 50° and 55° was 6·6 inches; between 52° and 53° the fall was only 4·8 inches, while it was 8·7 inches between 50° and 51°. The measured rainfall in the large towns of England and Wales ranged from 3·5 inches in Sunderland, to 8·1 in Bristol.

Second Quarter (*April, May, June*).—The temperature during April was remarkably changeable, and averaged 46°·3, or 0°·9 below the average in the corresponding period of 34 years. During May the weather was unusually warm, the mean temperature being equal to 55°·0, and exceeding the average by 2°·2. The first ten days in June were also warm, after which the mean temperature was continually below the average until the end of the quarter. From the 11th to the 30th of June the mean daily temperature was nearly 3° below the average.

The mean temperature for the quarter was 53°·4, and exceeded by 1°·1 the average for the same period in 104 years.

The fall of rain during the quarter at Greenwich was 5·4 inches, and nearly half an inch below the average of the corresponding period in 60 years. The amounts measured in the three months were respectively 1·6 inches in April, 1·5 in May, and 2·3 in June; the amounts measured in April and May were below the average, while that in June was slightly excessive. The average rainfall at the various stations of observation between latitude 50° and 55° was 5·9 inches; between 52° and 53° the fall averaged 5·4 inches, while it was 6·3 inches between 51° and 52°. The measured rainfall in the large English towns ranged from 4·1 inches in Norwich and Hull, to 10·1 inches in Bristol.

In flower—	The earliest.	The latest.
Wheat,	June 15, at Cardington;	June 24, at Silloth.
Barley,	June 16, at Llandudno;	June 18, at Cardington.
In ear—		
Wheat,	June 4, at Calcethorpe;	June 24, at Cockermouth.
Barley,	June 10, at Calcethorpe;	June 16, at Llandudno.
Oats,	June 23, at Calcethorpe;	June 30, at Cockermouth.

Third Quarter (July, August, September).—The cold weather which set in on the 11th of June, continued throughout July and until the 5th of August. The mean temperature during this period of 56 days showed an average deficiency of 3°·1. On the 6th of August warm summer weather set in, and with few exceptions prevailed up to the end of the quarter; this period also embraced 56 days, the average excess being 3°·2.

The mean temperature of the quarter, as determined by Mr. Glaisher, was 60°·7, and 1°·1 in excess of the average for the corresponding period in 104 years. July was cold, the mean showing a deficient temperature of 2°·5, whereas the excess in August and September was 2°·2 and 3°·5 respectively. Hot weather prevailed for a few days in the middle of August and during the third week of September.

The fall of rain during the quarter at Greenwich amounted to 10·3 inches, and exceeded by 2·9 inches the average quantity in the corresponding period of 60 years. The amounts measured in the three months were respectively 5·3 inches in July, 2·3 in August, and 2·7 in September. The rainfall in July was more than double the average amount; the amounts in August and September differed but slightly from the average. The average rainfall at the various stations of observation between latitude 50° and 55° was 10·3 inches; between 50° and 51° the average fall was 8·9 inches, whereas between 53° and 54° it was 11·9 inches.

Back to the year 1815 there have been only four instances in July with falls so large, viz., in the year 1828, when it was 7·0 inches; in 1834 it was 5·3 inches; in 1853 it was 6·0 inches, and in 1869 it was 5·8 inches. The fall of rain in July at nearly all stations greatly exceeded its average; it fell for the most part between the 13th and 23rd days, causing floods of very great violence in Monmouthshire and Glamorganshire, and in the Midland Counties generally. The fall of rain on the 14th day in Monmouthshire and Glamorganshire was as large as from 3 to 5 inches, and in Herefordshire and Gloucestershire from 1 to 3 inches, and exceeded 1 inch at many places.

Very heavy rain fell every day from the 13th to the 23rd of July inclusive, at one part of the country or other, but the north of England till the 17th was free from heavy rain. The falls of rain were so heavy that the natural drainage failed to carry off the water, and, wherever there was high ground in the watershed, the adjacent rivers became swollen, and caused injury to all property for considerable distances from the river, and in several instances loss of life. The rainfall measured in the large English towns ranged from 7·6 inches in Leeds, to 14·5 inches in Manchester. During the nine months ending 30th of September last, the rainfall at Greenwich, for London, amounted to 20·1 inches, and exceeded the average amount in the same period of 60 years by 1·9 inch.

Cut—

	The earliest.	The latest.
Wheat,	August 2, at Cardington;	August 31, at North Shields.
Barley,	July 30, at Llandudno;	August 17, at North Shields.
Oats,	July 27, at Strathfield Turgiss;	August 17, at Calcethorpe.

Fourth Quarter (*October*, *November*, *December*).—The month of October was cold and wet, the deficiency of temperature during the first 33 days of the quarter being 1°·8. From 3rd to 20th November a warm period prevailed, during which the excess of temperature averaged 3°·8. The weather was bitterly cold from 20th November to 16th December, and the average deficiency of temperature was 7°·4. During this period the sky was generally overcast, snow fell in all parts of the country, and the wind was northerly. From 17th December to the end of the year, mild weather again prevailed, with a south-westerly wind; and the excess of temperature averaged 5°·9. The mean temperature was 48°·5 in October, 42°·1 in November, and 38°·7 in December; the mean of each month was about a degree and a-half below the average for the corresponding month in the past 34 years.

The mean temperature of the quarter was 43°·1, and 0°·6 below the average for the same period in 104 years; although, compared with the average in the last 34 years, the deficiency was 1°·5. In the large provincial towns furnishing returns, the mean temperature of the quarter ranged from 41°·8 in Wolverhampton, to 43°·2 in Leeds.

The fall of rain measured at Greenwich during the three months was 8·1 inches, and exceeded by an inch the average for the corresponding quarter in 60 years. The amounts measured in each of the three months were respectively 4·1 inches in October, 2·9 inches in November, and 1·1 inch in December. The rainfall showed an excess in October and November, whereas it was nearly an inch below the average in December. The average rainfall at the various stations of observation, between latitude 50° and 55°, was 11·3 inches; between 50° and 51° the average fall was 12·4, whereas between 52° and 53° it did not exceed 10·4 inches. The rainfall measured in the large English towns ranged from 9·0 inches in Bradford, to 14·3 inches in Bristol.

During the year 1875 the rainfall measured at the Royal Observatory, Greenwich, amounted to 28·2 inches, and exceeded the annual average by 2·9 inches. The greatest fall of rain measured at Greenwich, in any one day, was on the 17th July, when 3·27 inches were registered. Rain fell on 152 days during the year. The mean temperature of the year 1875 was 49°·2, or 0°·6 above the annual average. The absolute lowest reading of the thermometer at night occurred in January, and was 18°·2; the absolute highest reading by day was registered in August, and was 85°·4.

In accordance with *extended observations*, it appears that the coldest days of the year are 8th and 9th January, on which the average temperature is 36°·2. After 9th January the average temperature rises about the tenth of a degree Fahrenheit per day, and reaches 39°·1 between 6th and 9th February, after which it falls somewhat lower for a few days.

METEOROLOGICAL OBSERVATIONS RECORDED AT THE ROYAL OBSERVATORY, GREENWICH, IN THE FIRST SIX MONTHS OF THE YEAR 1875.

1875.	Temperature of										Elastic Force of Vapour.		Weight of Vapour in a Cubic Foot of Air.	
	Air.			Evaporation.		Dew Point		Air—Daily Range.		Water of the Thames.				
MONTHS.	Mean.	Diff. from average of 104 years.	Diff from average of 34 years	Mean.	Diff. from average of 34 years	Mean.	Diff. from average of 34 years	Mean	Diff from average of 34 years.		Mean.	Diff from average of 34 years.	Mean.	Diff from average of 34 years
	°	°	°	°	°	°	°	°	°	°	in.	in.	grs	grs
January ..	43·4	+7·0	+5·0	41·0	+4·0	38·2	+3·2	9·0	−0·6	39·4	0·230	+0·029	2·7	+0·3
February ..	35·0	−3·6	−4·3	33·2	−4·4	30·3	−4·7	9·8	−1·5	38·9	0·168	−0·038	2·0	−0·4
March ..	40·2	−0·9	−1·5	37·4	−2·0	33·8	−2·7	12·5	−2·2	41·3	0·194	−0·023	2·3	−0·2
Means ..	39·5	+0·8	−0·3	38·6	+0·6	34·1	−1·4	10·4	−1·4	39·9	0·221	+0·013	2·5	−0·1
	°	°	°	°	°	°	°	°	°	°	in.	in.	grs.	grs
April	46·3	+0·2	−0·9	42·5	−1·6	38·2	−2·5	20·1	+1·4	48·4	0·232	−0·023	2·7	−0·2
May	55·0	+2·5	+2·2	50·5	+1·5	46·2	+0·9	19·9	−0·6	58·6	0·312	+0·011	3·5	+0·1
June	58·9	+0·7	0·0	53·9	−0·7	49·5	−1·2	22·1	+1·0	62·2	0·354	−0·017	4·0	−0·1
Means ..	53·4	+1·1	+0·4	49·0	−0·3	44·6	−0·9	20·7	+0·6	56·4	0·299	−0·010	3·4	−0·1

NOTE.—In reading this Table it will be borne in mind that the *minus* sign (−) signifies *below* the average, and that the *plus* sign (+) signifies *above* the average.

Meteorological Observations recorded at the Royal Observatory, Greenwich, in the First Six Months of the Year 1875.

1875. Months.	Degree of Humidity.		Reading of Barometer.		Weight of a Cubic Foot of Air.		Rain.		Daily Horizontal movement of the Air	Reading of Thermometer on Grass.				
										Number of Nights it was			Lowest Reading at Night	Highest Reading at Night.
	Mean	Diff from average of 34 years	Mean	Diff. from average of 31 years	Mean.	Diff. from average of 34 years	Amount.	Diff. from average of 60 years		At or below 30°.	Between 30° and 40°	Above 40°		
			in.	in	grs	grs	in.	in.	Miles				°	°
January ..	81	− 7	29·762	+0·023	548	− 5	3·0	+1·1	339	5	18	8	15·5	42·7
February .	82	+ 3	29·857	+0·060	559	+ 6	0·8	−0·7	246	21	6	1	13·5	41·0
March ..	78	− 4	29·954	+0·204	555	+ 5	0·6	−1·0	309	20	7	4	17·1	46·3
							Sum	Sum	Mean	Sum	Sum	Sum	Lowest	Highest
Means ..	80	− 2	29·858	+0·096	554	+ 2	4·4	−0·6	298	46	31	13	13·5	46·3
			in.	in.	grs.	grs.	in	in	Miles				°	°
April ..	74	− 5	29·842	+0·074	547	+ 4	1·6	−0·1	236	14	13	3	20·8	42·7
May	73	− 3	29·809	+0·029	532	− 9	1·5	−0·6	272	1	18	12	29·3	47·8
June ..	71	− 3	29·743	−0·072	537	+ 5	2·3	+0·3	293	0	5	25	33·5	55·9
							Sum	Sum	Mean	Sum	Sum	Sum	Lowest	Highest
Means ..	73	− 4	29·798	+0·010	539	0	5·4	−0·4	267	15	36	40	20·8	55·9

NOTE.—In reading this Table it will be borne in mind that the *minus* sign (−) signifies *below* the average, and that the *plus* sign (+) signifies *above* the average

Meteorological Observations recorded at the Royal Observatory, Greenwich, in the Last Six Months of the Year 1875.

1875.	Temperature of										Elastic Force of Vapour		Weight of Vapour in a Cubic Foot of Air	
	Air.			Evaporation.		Dew Point.		Air—Daily Range.		Water of the Thames.				
Months.	Mean.	Diff. from average of 104 years.	Diff from average of 34 years	Mean.	Diff from average of 34 years	Mean.	Diff from average of 34 years.	Mean	Diff from average of 34 years		Mean	Diff. from average of 34 years.	Mean	Diff. from average of 34 years
	°	°	°	°	°	°	°	°	°	°	in	in.	grs	grs
July	59·1	−2·5	−3·1	56·2	−1·5	53·5	−0·4	17·5	−3·5	62·2	0·412	−0·005	4·7	+0·1
August ..	63·0	+2·2	+1·6	59·8	+2·5	57·1	+3·4	19·9	+0·1	65·8	0·460	+0·045	5·1	+0·5
September	60·0	+3·5	+2·8	56·7	+2·7	53·8	+2·7	18·9	+0·4	63·7	0·415	+0·036	4·6	+0·4
Means ..	60·7	+1·1	+0·4	57·6	+1·2	54·8	+1·9	18·8	−1·0	63·9	0·429	+0·025	4·8	+0·3
	°	°	°	°	°	°	°	°	°	°	in	in	grs	grs.
October ..	48·5	−1·1	−1·7	46·4	−1.8	44·1	−2·1	13·7	−1.1	5[illegible]·8	0·290	−0.024	3·3	−0·3
November ..	42·1	−0·2	−1·5	40·2	−1·2	37·7	−1·8	10·1	−1·6	44·0	0·227	−0·020	2·6	−0·2
December ..	38·7	−0·4	−1.4	37.3	−1·3	35·5	−1.3	8·2	−1·3	38·3	0·208	−0·012	2·3	−0·3
Means ..	43·1	−0.6	−1·5	41·3	−1.4	39·1	−1·7	10·7	−1·3	45·0	0·242	−0·019	2·7	−0·3

Note.—In reading this Table it will be borne in mind that the *minus* sign (−) signifies *below* the average, and that the *plus* sign (+) signifies *above* the average.

METEOROLOGICAL OBSERVATIONS RECORDED AT THE ROYAL OBSERVATORY, GREENWICH, IN THE LAST SIX MONTHS OF THE YEAR 1875.

1875. MONTHS.	Degree of Humidity		Reading of Barometer.		Weight of a Cubic Foot of Air		Rain.		Daily Horizontal movement of the Air.	Reading of Thermometer on Grass.				
										Number of Nights it was			Lowest Reading at Night	Highest Reading at Night.
	Mean	Diff. from average of 34 years.	Mean.	Diff from average of 34 years.	Mean.	Diff. from average of 34 years.	Amount	Diff. from average of 60 years		At or below 30°	Between 30° and 40°	Above 40°.		
			In	in	grs	grs.	in.	in.	Miles				°	°
July	83	+ 8	29·792	−0·010	531	+ 3	5·3	+2·7	286	0	2	29	36·3	56·7
August ..	81	+ 5	29·868	+0·075	528	− 1	2·3	−0·1	222	0	2	29	36·2	58·9
September	80	− 1	29·867	+0·062	531	− 2	2·7	+0·3	253	0	2	28	38·0	58·3
Means ..	81	+ 4	29·842	+0·042	530	0	Sum 10·3	Sum +2·9	Mean 254	Sum 0	Sum 6	Sum 86	Lowest 36·2	Highest 58·9
			in.	in	grs	grs	in.	in.	Miles.				°	°
October ..	86	− 1	29·608	−0·091	540	+ 1	4·1	+1·3	269	5	16	10	28·6	47·6
November	86	− 2	29·630	−0·125	547	− 1	2·9	+0·6	350	10	15	5	23·7	48·2
December	88	0	29·937	+0·136	557	+ 5	1·1	−0.9	287	13	15	3	20·1	41·5
Means ..	87	− 1	29.725	−0·027	548	+ 2	Sum 8·1	Sum +1·0	Mean 302	Sum 28	Sum 46	Sum 18	Lowest 20·1	Highest 48·2

NOTE.—In reading this Table it will be borne in mind that the *minus* sign (−) signifies *below* the average, and that the *plus* sign (+) signifies *above* the average

CORN: IMPORTATIONS, SALES, AND PRICES.

QUANTITIES of WHEAT, WHEATMEAL and FLOUR, BARLEY, OATS, PEAS and BEANS, IMPORTED into the UNITED KINGDOM in the Year 1875.

1875.	Wheat.	Wheatmeal and Flour.	Barley.	Oats.	Peas.	Beans.
	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.
January ..	2,627,060	519,795	1,292,935	638,171	131,211	177,784
February	2,399,377	507,887	1,168,824	571,475	85,275	158,937
March ..	2,201,510	478,374	793,909	315,493	72,125	241,272
April ..	3,707,275	468,348	918,166	1,001,246	83,307	270,756
May ..	4,215,663	521,428	772,407	2,009,593	184,597	344,881
June ..	3,835,539	324,866	714,684	1,004,952	334,031	413,204
In first Six Months	18,986,424	2,820,698	5,660,925	5,540,930	890,546	1,606,834
July	5,361,224	509,858	701,877	1,940,288	136,025	268,457
August ..	5,745,774	585,175	826,788	1,382,225	75,087	288,587
September	6,647,434	493,318	561,789	1,118,495	57,710	314,266
October ..	5,144,080	427,529	923,745	664,521	50,680	282,197
November	5,538,097	572,262	1,493,656	877,439	184,871	372,675
December	4,363,360	639,849	887,136	921,585	208,114	320,355
In last Six Months	32,799,969	3,227,991	5,394,991	6,904,553	712,487	1,846,537
Year ..	51,786,393	6,048,689	11,055,916	12,445,483	1,603,033	3,453,371

NOTE.—The average weights *per quarter* of corn, as adopted in the office of the Inspector-General of Imports and Exports, are as follow:—For wheat, $485\frac{1}{3}$ lbs., or $4\frac{1}{3}$ cwts.; for barley, 400 lbs., or $3\frac{4}{7}$ cwts.; for oats, 308 lbs., or $2\frac{3}{4}$ cwts. Corn has been entered and charged with duty by *weight* instead of *measure* since September, 1864.

COMPUTED REAL VALUE of CORN IMPORTED into the UNITED KINGDOM in each of the FIVE YEARS, 1871-75.

	1871.	1872.	1873.	1874.	1875.
	£.	£.	£.	£.	£.
Wheat	23,345,630	26,046,876	28,446,689	25,201,062	27,418,970
Barley	3,407,425	6,194,155	4,010,344	5,266,096	4,630,654
Oats	4,141,687	4,212,086	4,804,118	5,118,785	5,407,928
Maize	6,470,789	8,696,362	6,621,720	7,484,178	8,112,158
Other kinds	1,729,048	1,747,073	1,788,716	1,959,237	2,304,218
Wheat Flour	3,502,784	4,092,189	5,839,197	5,709,820	4,828,167
Other kinds of Flour	10,712	9,883	10,570	14,405	12,130
Total of Corn ..	42,608,075	50,998,624	51,521,354	50,753,583	52,714,225

QUANTITIES of BRITISH WHEAT SOLD in the Towns from which Returns are received under the Act of the 27th & 28th VICTORIA, cap. 87, and their AVERAGE PRICES, in each of the TWELVE MONTHS of the YEARS 1870-75.

	QUANTITIES IN QUARTERS					
	1870	1871.	1872	1873	1874.	1875.
	quarters	quarters	quarters	quarters	quarters	quarters
First month ..	187,027	267,827	194,719	183,987	187,106	210,661
Second month	231,428	309,376	193,910	202,977	189,031	223,974
Third month (five weeks)	314,040	377,003	245,612	238,125	206,145	292,172
Fourth month	242,457	293,494	191,522	159,268	150,725	233,970
Fifth month ..	281,620	222,003	231,780	225,595	175,715	234,683
Sixth month (five weeks)	296,028	229,749	268,626	219,750	172,298	216,016
Seventh month	171,005	120,154	109,543	101,101	95,871	121,684
Eighth month	201,788	123,889	126,769	96,986	82,564	135,456
Ninth month (five weeks)	435,398	371,590	295,774	266,856	323,153	199,314
Tenth month	340,445	367,672	264,934	265,122	248,984	226,503
Eleventh month	298,407	269,351	195,743	214,026	225,162	186,607
Twelfth month (five weeks)	352,629	322,756	263,152	285,648	335,339	234,035

	AVERAGE PRICES PER QUARTER.					
	1870.	1871.	1872.	1873.	1874.	1875.
	s d	s. d.	s. d.	s d.	s. d.	s. d.
First month ..	43 11	52 8	55 4	55 10	62 4	44 4
Second month	41 10	53 6	55 8	56 5	63 4	42 3
Third month (five weeks)	41 3	54 6	55 1	55 6	61 1	41 2
Fourth month	42 7	58 2	54 2	54 10	60 0	43 0
Fifth month ..	43 10	59 1	56 3	55 8	62 2	42 5
Sixth month (five weeks)	47 0	59 8	58 11	58 4	61 2	42 2
Seventh month	50 9	58 7	58 7	59 6	60 8	45 3
Eighth month	53 11	57 11	59 9	60 1	58 4	52 4
Ninth month (five weeks)	47 0	57 0	58 7	63 10	48 11	49 3
Tenth month ..	47 4	56 5	58 7	60 10	44 8	46 1
Eleventh month	50 1	56 2	56 11	60 9	43 11	47 4
Twelfth month (five weeks)	52 4	56 2	56 7	61 6	44 6	46 4

AVERAGE PRICES of BRITISH CORN per Quarter (Imperial measure) as received from the INSPECTORS and OFFICERS of EXCISE according to the Act of 27th & 28th VICTORIA, cap. 87, in each of the FIFTY-TWO WEEKS of the YEAR 1875.

Week ending	Wheat.		Barley.		Oats.		Week ending	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.		s.	d.	s.	d.	s.	d.
January 2..	44	2	44	6	29	7	July 3..	43	6	35	5	30	4
January 9..	45	1	44	8	30	1	July 10..	44	4	37	2	30	6
January 16..	44	6	45	6	29	1	July 17..	46	0	33	11	30	4
January 23..	43	9	45	3	29	8	July 24..	47	5	35	0	29	0
January 30..	43	0	45	0	28	9	July 31..	51	0	31	4	30	7
February 6..	42	7	45	0	29	11	August 7..	53	10	40	4	32	4
February 13..	41	11	44	5	29	6	August 14..	51	9	34	11	30	4
February 20..	41	6	43	3	29	9	August 21..	53	0	33	7	32	1
February 27..	40	11	42	11	29	7	August 28	52	9	31	4	28	0
March 6..	40	1	42	0	29	8	September 4	49	3	35	0	30	0
March 13..	41	4	42	5	29	8	September 11	48	8	35	7	29	0
March 20..	41	9	42	2	30	2	September 18	48	7	35	7	27	4
March 27..	41	10	41	8	30	3	September 25	47	1	35	9	26	9
Average of Winter Quarter	42	6	43	9	29	8	Average of Summer Quarter	49	0	34	11	29	8
April 3..	42	5	41	3	30	3	October 2..	45	11	36	4	26	5
April 10..	43	1	40	8	29	6	October 9..	45	10	36	2	24	11
April 17..	43	4	40	6	30	0	October 16..	46	0	36	10	24	0
April 24..	43	4	41	1	29	9	October 23..	46	8	37	7	24	4
May 1..	42	10	38	10	30	0	October 30	47	4	38	1	24	6
May 8..	42	8	39	0	30	0	November 6	47	6	38	3	24	5
May 15..	42	2	37	4	30	7	November 13	47	8	38	7	25	9
May 22..	42	0	38	3	31	3	November 20	47	0	38	3	25	8
May 29..	41	10	38	8	29	7	November 27	46	8	36	10	26	5
June 5..	41	11	36	9	30	7	December 4	46	7	36	1	25	1
June 12..	41	11	34	11	32	11	December 11	46	1	35	4	24	9
June 19..	42	3	39	6	30	8	December 18	46	7	35	4	24	10
June 26..	42	11	32	3	31	10	December 25	45	9	34	9	23	4
Average of Spring Quarter	42	6	38	4	30	6	Average of Autumn Quarter	46	7	36	9	24	11

Quantities of Wheat, Barley, Oats, Peas, Beans, Indian Corn or Maize, Wheatmeal and Flour, Imported in the Four Years 1872–75; also the Countries from which the Wheat, Wheatmeal, and Flour were obtained.

	1872.	1873.	1874.	1875.
Wheat from—	cwts.	cwts.	cwts.	cwts.
Russia	17,840,640	9,598,096	5,714,488	9,995,295
Denmark	431,176	301,758	167,286	493,599
Germany	3,887,746	2,153,857	3,053,680	5,615,984
France	2,843,016	1,170,522	300,299	1,296,920
Austrian Territories	54,732	29,730	2,814	18,564
Turkey and Wallachia and Moldavia	838,073	367,487	659,676	1,308,137
Egypt	2,337,208	1,260,401	293,880	2,093,853
United States	8,606,403	19,742,726	23,048,552	23,463,910
Chili	1,434,125	1,557,128	1,925,334	900,880
British North America ..	1,719,378	3,767,330	3,807,174	3,604,610
Other countries	1,997,731	3,802,595	2,506,277	2,994,641
Total Wheat ..	41,990,228	43,751,630	41,479,460	51,786,393
Barley	15,078,140	9,232,485	11,379,736	11,055,916
Oats	11,567,058	11,922,736	11,396,010	12,445,483
Peas	1,290,076	1,211,068	1,808,980	1,603,033
Beans	2,937,514	2,976,500	2,363,151	3,453,371
Indian Corn, or Maize	24,563,334	18,768,127	17,683,212	20,420,292
Wheatmeal and Flour from—				
Germany	1,054,574	687,243	751,366	796,301
France	1,341,465	1,669,356	659,568	1,752,079
United States..	743,412	1,580,697	3,290,235	2,273,846
British North America.. ..	339,300	444,729	389,355	358,766
Other countries	917,308	1,822,235	1,139,084	867,697
Total Wheatmeal and Flour	4,396,059	6,204,260	6,229,608	6,048,689
Indian Corn Meal	5,384	6,836	8,511	7,494

The AVERAGE PRICES of Consols, of Wheat, of Meat, and of Potatoes; also the AVERAGE NUMBER of PAUPERS relieved on the *last day* of each Week; and the MEAN TEMPERATURE, in each of the Twelve Quarters ending December 31st, 1875.

Quarters ending	AVERAGE PRICES.						PAUPERISM.		Mean Temperature.
	Consols (for Money)	Minimum Rate per Cent. of Discount charged by the Bank of England	Wheat per Quarter in England and Wales.	Meat per lb. at the Metropolitan Meat Market (by the Carcase).		Potatoes (York Regents) per Ton, at Waterside Market, Southwark.	Quarterly Average of the Number of Paupers relieved on the *last day* of each week.		
				Beef.	Mutton.		In-door.	Out-door.	
1873	£.		*s.* *d.*						°
Mar. 31	92⅜	3·9	55 10	5½*d.*—8*d.* Mean 6¾*d.*	6¼*d.*—9*d.* Mean 7⅝*d.*	179*s.*—235*s.* Mean 207*s.*	150,392	703,357	39·4
June 30	93⅜	5·2	56 5	6*d.*—8¾*d.* Mean 7⅛*d.*	6¾*d.*—9½*d.* Mean 8⅛*d.*	183*s.*—242*s.* Mean 212*s.* 6*d.*	135,491	666,126	51·8
Sept. 30	92⁴⁄₈	3·8	61 4	5¾*d.*—8¾*d.* Mean 7¼*d.*	6½*d.*—9¼*d.* Mean 7⅞*d.*	95*s.*—120*s.* Mean 107*s.* 6*d.*	127,674	632,412	60·3
Dec. 31	92⅛	6·3	1 1	5*d.*—8½*d.* Mean 6¾*d.*	5¾*d.*—8½*d.* Mean 7⅛*d.*	96*s.* 6*d.*—117*s.* 6*d.* Mean 107*s.*	137,409	625,316	44·2
1874									
Mar. 31	92	3·6	62 2	5¾*d.*—8¼*d.* Mean 6¾*d.*	5½*d.*—8¼*d.* Mean 6⅞*d*	112*s.*—127*s.* Mean 119*s.* 6*d.*	146,082	641,910	41·4
June 30	93	3·4	61 1	5*d.*—8*d.* Mean 6½*d.*	5*d.*—8¼*d.* Mean 6⅝*d.*	135*s.*—165*s.* Mean 150*s.*	133,846	614,738	52·8
Sept. 30	92⅝	3·0	55 5	5¼*d.*—8*d.* Mean 6⅝*d.*	5¼*d.*—7¾*d.* Mean 6½*d.*	75*s.* 6*d.*—104*s.* 6*d.* Mean 90*s.*	129,996	592,958	60·9
Dec. 31	93	4·7	44 4	4⅞*d.*—8¼*d.* Mean 6½*d.*	4¾*d.*—8*d.* Mean 6¼*d.*	73*s.*—96*s.* Mean 84*s.* 6*d.*	138,899	587,776	42·3
1875									
Mar. 31	92⅛	3·7	42 6	5*d.*—8*d.* Mean 6½*d.*	4¾*d.*—8*d.* Mean 6½*d.*	81*s.* 3*d.*—111*s.* 3*d.* Mean 96*s* 3*d.*	146,708	622,652	39·5
June 30	93⅝	3·5	42 6	5¼*d.*—8¼*d.* Mean 6¾*d.*	5½*d.*—9½*d.* Mean 7½*d.*	80*s.* 6*d*—120*s.* 6*d.* Mean 100*s.* 6*d*	131,717	592,362	53·4
Sept. 30	94⅜	2·4	49 0	5½*d.*—8½*d.* Mean 7*d.*	5½*d.*—9½*d.* Mean 7½*d.*	70*s.* 6*d.*—93*s.* 6*d.* Mean 82*s.*	125,614	555,409	60·7
Dec. 31	94⅛	3·2	46 7	5½*d.*—8¼*d.* Mean 6⅞*d.*	6*d.*—9¼*d.* Mean 7⅝*d.*	105*s.* 6*d.*—127*s.* 6*d* Mean 116*s.* 6*d.*	136,079	546,288	43·1

The annexed Return shows the number of Beasts exhibited and the prices realised for them at the Christmas markets since 1842:—

Year.	Beasts.	s. d. s. d	Year.	Beasts.	s. d. s d.
1842	4,541	3 4—4 8	1859	7,560	3 6—5 4
1843	4,510	4 8—4 4	1860	7,860	3 4—5 6
1844	5,713	4 0—4 6	1861	8,840	3 4—5 0
1845	5,326	3 6—4 8	1862	8,430	3 4—5 0
1846	4,570	4 0—5 8	1863	10,372	3 6—5 2
1847	4,282	3 4—4 8	1864	7,130	3 8—5 8
1848	5,942	3 4—4 8	1865	7,530	3 4—5 4
1849	5,765	3 4—4 0	1866	7,340	3 8—5 6
1850	6,341	3 0—3 10	1867	8,110	3 4—5 0
1851	6,103	2 8—4 2	1868	5,320	3 4—5 8
1852	6,271	2 8—4 0	1869	6,728	3 6—6 2
1853	7,037	3 2—4 10	1870	6,425	3 6—6 2
1854	6,181	3 6—5 4	1871	6,320	3 10—6 2
1855	7,000	3 8—4 2	1872	7,560	4 6—6 0
1856	6,748	3 4—5 0	1873	6,170	4 4—6 6
1857	6,856	3 4—4 8	1874	6,570	4 4—6 8
1858	6,424	3 4—5 0	1875	7,660	4 6—6 6

Average Prices of British Wheat, Barley, and Oats, per Imperial Quarter, in each of the Sixteen Years 1860–75.

Year	Wheat.	Barley.	Oats.	Year	Wheat.	Barley	Oats.
	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.
1860	53 3	36 7	24 5	1868	63 9	43 0	28 1
1861	55 4	36 1	23 9	1869	48 2	39 5	26 0
1862	55 5	35 1	22 7	1870	46 10	34 7	22 10
1863	44 9	33 11	21 2	1871	56 10	36 2	25 2
1864	40 2	29 11	20 1	1872	57 0	37 4	23 2
1865	41 10	29 9	21 10	1873	58 8	40 5	25 5
1866	49 11	37 5	24 7	1874	55 9	44 11	28 10
1867	64 6	40 0	26 1	1875	45 2	38 5	28 8

CERTAIN ARTICLES of FOREIGN and COLONIAL PRODUCTION IMPORTED in the YEARS 1872–75; and their QUANTITIES.

	1872.	1873.	1874.	1875.
ANIMALS, Living:				
Oxen, Bulls, and Cows, number	139,468	157,549	157,821	224,969
Calves .. .. ,,	33,525	43,338	36,041	38,729
Sheep .. .. ,,	809,822	851,035	758,902	977,863
Lambs .. .. ,,				
Swine and Hogs .. .. ,,	16,101	80,976	115,389	71,928
Bones (burnt or not, or as animal charcoal) .. .. tons	111,692	69,945	82,242	97,162
Cotton, Raw .. .. .. cwts.	12,578,906	13,693,472	14,062,075	13,360,686
Flax .. .. ,,	2,022,507	2,194,473	2,373,993	1,765,068
Guano .. .. ,,	118,704	184,921	112,285	114,223
Hemp .. .. ,,	1,105,983	1,251,030	1,241,115	1,342,466
Hops .. .. ,,	135,965	123,228	146,233	256,333
Hides untanned: Dry .. ,	815,542	615,548	554,964	552,629
,, ,, Wet .. ,,	626,064	712,040	711,161	652,634
Petroleum .. .. tuns	25,300	65,630	85,630	77,661
Oilseed Cakes .. .. .. tons	134,300	138,119	157,476	180,305
Potatoes .. .. cwts.	5,987,429	7,473,230	3,990,991	4,698,870
Butter .. .. ,,	1,138,081	1,277,729	1,620,674	1,467,183
Cheese .. .. ,,	1,057,883	1,355,267	1,488,223	1,626,413
Eggs .. .. per great hundred	4,429,990	5,500,277	5,672,049	6,178,433
Lard .. .. cwts.	578,676	627,044	374,582	539,341
Bacon and Hams .. .. ,,	2,001,855	2,973,314	2,541,681	2,629,901
Salt Beef .. .. ,,	193,215	218,563	231,532	181,504
Salt Pork .. .. ,,	212,382	266,084	287,238	232,782
Clover Seeds .. .. ,,	290,849	278,419	256,025	306,551
Flax-seed and Linseed .. qrs.	1,514,947	1,443,018	1,682,875	1,970,267
Rape .. .. ,,	246,549	275,823	289,781	501,350
Sheep and Lambs' Wool .. lbs.	302,500,925	313,061,244	338,800,481	361,133,165

ACREAGE under each Description of CROP, FALLOW, and GREAT BRITAIN and

DESCRIPTION of CROPS and LIVE STOCK.	GREAT BRITAIN.		
	1873.	1874.	1875.
CORN CROPS:—	Acres.	Acres.	Acres.
Wheat	3,490,380	3,630,300	3,342,481
Barley or Bere	2,335,913	2,287,987	2,509,701
Oats	2,676,227	2,596,384	2,664,009
Rye	51,634	47,228	54,903
Beans	586,561	559,044	564,181
Peas	318,213	310,547	316,375
TOTAL CORN CROPS	9,458,928	9,431,490	9,451,650
GREEN CROPS:—			
Potatoes	514,682	520,430	522,653
Turnips and Swedes	2,121,908	2,133,336	2,142,698
Mangold	325,702	322,614	361,617
Carrots	15,503	13,927	14,936
Cabbage, Kohl-rabi, and Rape	174,762	169,285	189,733
Vetches, Lucerne, and any other crop (except clover or grass)	423,929	421,678	432,470
TOTAL GREEN CROPS	3,576,486	3,581,270	3,664,107
OTHER CROPS, GRASS, &c.:—			
Flax	14,683	9,394	6,751
Hops	63,278	65,805	69,171
Bare fallow or uncropped arable land	706,498	660,206	557,979
Clover and artificial and other grasses under rotation	4,366,818	4,340,742	4,354,071
Permanent pasture, meadow, or grass not broken up in rotation (exclusive of heath or mountain land)	12,915,929	13,178,012	13,313,621
LIVE STOCK:—	No.	No.	No.
Cattle	5,964,549	6,125,491	6,012,824
Sheep	29,427,635	30,313,941	29,167,438
Pigs	2,500,259	2,422,832	2,229,918
* Total number of horses used for agriculture, unbroken horses, and mares kept solely for breeding	1,276,444	1,311,739	1,340,129
Acreage of orchard, or of arable or grass-land, used also for fruit-trees	148,221	150,526	154,584
Acreage of woods, coppices, and plantations	2,187,078	2,187,078	2,187,078

* In Ireland all descriptions of

Grass, and Number of Cattle, Sheep, and Pigs, in Ireland, in 1873–74–75.

Ireland.			United Kingdom, including the Islands.		
1873.	1874.	1875.	1873.	1874.	1875.
Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
168,435	188,711	161,321	3,670,259	3,830,767	3,514,086
231,023	212,230	234,503	2,574,529	2,507,130	2,751,362
1,510,089	1,480,186	1,499,371	4,198,495	4,088,825	4,176,177
8,405	8,979	9,556	60,121	56,274	64,579
11,129	9,646	9,970	598,121	568,984	574,414
1,743	1,756	1,677	321,007	312,854	318,410
1,930,824	1,901,508	1,916,398	11,422,532	11,364,834	11,399,030
903,282	892,421	900,277	1,425,720	1,420,825	1,431,879
347,904	333,487	332,783	2,479,847	2,476,757	2,485,256
38,096	38,161	43,172	364,552	361,499	405,527
3,698	3,359	3,303	19,891	17,865	18,833
37,355	41,105	41,896	212,326	210,578	231,717
42,085	44,829	48,655	468,776	470,159	483,817
1,372,420	1,353,362	1,370,086	4,971,112	4,957,683	5,057,029
129,432	106,886	101,248	144,115	116,280	107,999
..	..	..	63,278	65,806	69,171
13,474	12,187	11,287	720,990	673,376	570,005
1,837,483	1,906,083	1,943,923	6,240,900	6,284,925	6,337,953
10,420,695	10,472,161	10,431,776	23,363,990	23,680,416	23,773,602
No.	No.	No.	No.	No	No.
4,151,561	4,118,113	4,111,990	10,153,670	10,281,036	10,162,787
4,486,453	4,437,613	4,248,158	33,982,404	34,837,597	33,491,948
1,044,218	1,096,494	1,249,235	3,563,532	3,537,354	3,435,167
531,708*	525,770*	526,160*	1,817,831	1,847,148	1,875,851
325,173	325,173	325,173	2,512,251	..	..

horses are included in the Returns.

The following remarks relating to Irish and Foreign Butter and to Cheese are extracted from 'The Grocer':—

IRISH BUTTER.—The quotations throughout the month of January were high, influenced no doubt, to some extent, by the drought of last summer having lessened the make; and transactions were very limited. In February a great deal of heavy rain fell—almost from the beginning to the end of the month—checking agricultural operations to a considerable extent. Transactions this month were limited, the wharf deliveries scarcely amounting to 600 firkins in four weeks. The lock-out of miners in Wales continued throughout the month of March, and many of their families were in great distress; in Lancashire a lock-out of 45,000 cotton-spinners was threatened. These matters were a great check upon business operations; there was a difficulty in effecting sales, the wharf deliveries were again small, scarcely averaging 200 firkins weekly. In April vegetation was backward; and the lock-out of the miners in Wales—which had now lasted fourteen weeks—still continued, causing great distress in their families and much interruption of trade; the stocks of Irish were small, scarcely exceeding 400 firkins at the beginning of April, and only 125 firkins at the wharves at the close. The market was exceedingly dull, prices at the close of the month showing a reduction on nearly all descriptions. In May many of the Welsh miners returned to work: an idea of the business done this month may be formed by the fact of 130 firkins lying at the wharves at the commencement of the month and 200 firkins being on hand at the end: the arrivals were only about 1500 firkins. Throughout the month there was not even any quoted price for Clonmels or Limericks. In June the sales were few, confined chiefly to Corks, and the greater portion of these were low qualities; there were no quotations for Clonmels and Limericks during this month. In July the sales were sparingly effected, quotations remaining in the same state as at the two previous months, until the third week; the little business done was again confined chiefly to Corks, and for these, prices remained nearly the same throughout. There were no quotations for Limericks this month. In August there was a slight improvement in the demand, a few Clonmels and Limericks were sold, but the chief part of the transactions were still confined to Corks; there was again scarcely any variation in prices. In September the wide difference between the prices of best Irish and best Foreign caused a little improvement in the demand for the former; the asking-rates, for best Clonmels, &c., early in this month, were 126*s.* to 132*s.*, gradually advancing to 134*s.* to 138*s.* at the close. In October there was a little more doing in sales, but still a wide difference in prices; Clonmels, &c., varied to only a small extent during this month. In November a moderate extent of business was done, sales were probably helped by the fear of using low-priced adulterated foreign; there was very little alteration this month in the asking-prices for Clonmels. In December supplies were more liberal than those of last year, as was the demand also.

FOREIGN BUTTER.—Prices throughout January were high, quotations for best Normandys being 154*s.* to 162*s.* in the first week, and 158*s.* to 166*s.* during the remainder of the month. Quotations for American began at 112*s.* to 138*s.* and closed at 105*s.* to 125*s.* In February supplies were moderate, but fine qualities, being scarce, commanded high prices; inferior qualities were plentiful, and of difficult sale. In March the supplies were barely average ones; finest qualities, in the early part of the month, were in good demand, but with a slight increase in the supply of fresh English, the market at the close was a little easier, and holders of inferior qualities anxiously pressed sales—good buyers could almost dictate terms for such. In April supplies were moderate, and there was a steady demand for finest qualities; but the market was overstocked with second-rate and inferior descriptions, the sale of the latter was difficult, and quotations were scarcely reliable. In May supplies were considerably less than those of the corresponding months in 1873 and 1874; there was a steady demand for finest qualities, but lower descriptions were taken sparingly. In June the supplies were about the average, still, however, a large proportion was of inferior quality. In July there was a steady demand for best Normandy's, without variation in asking-rates;

Dutch, as usual, was an unsettled market. In August the supplies were full average; finest qualities moved off steadily, but inferiors were difficult; sale and prices irregular. In September quotations for best Normandy's began at 136*s.* to 144*s.*, and closed at 142*s.* to 146*s.* In October there was a steady demand for fine qualities, also for genuine useful kinds, but the stuff sent to represent butter was a difficult sale. In November the supplies were moderate; there was a good demand for finest and good useful, but inferiors were difficult to sell; there was a steady demand this month for best Normandy's throughout. In December the supplies of best foreign were equal to our wants, those of the inferior and adulterated classes were in excess of them.

Cheese.—In January there was a firm and steady market for the finest descriptions: quotations for the best Cheddar were 88*s.* to 94*s.*; best Cheshire, 86*s.* to 88*s.*; best American began at 72*s.* to 76*s.*, and closed at 72*s.* to 74*s.* In February the market was firm for finest English, but holders of useful descriptions were desirous to effect sales; although the arrivals of American were small, holders showed a desire to lessen their stocks. In March finest English was scarce and held firmly, but holders of second-rate qualities showed a desire to sell. In April finest English was held firmly, the season being a backward one, but holders of lower qualities were anxious sellers; American supplies were liberal. Finest English cheese held firmly in May, but useful and second-rate qualities were pressed for sale. Americans, with some new on passage, began to show symptoms of weakness, the sale of inferior qualities being anxiously pressed. In June the best old American was getting into a narrow compass, but great desire was shown to sell inferiors. In July there was very little really fine English on offer, for choice parcels high rates were asked, but anything of middling quality (owing to the low prices at which new American was offered) was difficult sale; the supplies of new American into Liverpool this month were very large. In August the chief part of the demand rested upon American, arrivals of which continued large. In September fine English held firmly, second-rate qualities were difficult; the demand rested chiefly upon American, prices for which were moderate, being amongst the cheapest articles of good food offered for sale that month. In October the moderate prices at which Americans were offered, and the goodness of the quality of the best, greatly lessened the demand for English. In November the finest English held steadily, and the sale of second-rates was pressed; American scarcely varied this month. In December the market was steady, but not active; holders of fine English were not pressing sellers, but were anxious to make progress with second-rates. The supplies this month were liberal, quotations for best having varied little for several weeks.

Cork Butter Market.—After the previous years of drought, and consequent short supplies, the genial spring and moist summer of 1875 gave promise of an abundant make of butter, which was fully redeemed; for the quantity sold in the Cork market—which is *par excellence* the chief butter market of Ireland—has exceeded that of 1874 by about 65,000 firkins, the total for 1875 being in round numbers 435,000 firkins, and exceeding that of any former year in the history of this market. This increase in supply would not now, however, have any appreciable effect on prices, as the increasing population of Great Britain is yearly taking a larger quantity; but the general dulness of trade, and the reduced employment and wages of the workmen in England, have been sensibly felt in a much lower scale of prices, so that the money-value of the increased supply of 1875 was not much over that of the smaller quantity of 1874, and was in keeping with the general dulness of the time. The year 1875 has also been one of very little fluctuation.

STATISTICS OF DAIRY PRODUCE.

(*The following Quotations, &c., are extracted from* 'The Grocer.')

PRICES CURRENT on 1st SATURDAY in JANUARY of each YEAR, from the latest actual MARKET SALES.

	1871.	1872.	1873.	1874.	Average Annual Price in the 5 years, 1870–74.	1875.	1876.
Butter:	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.
Carlow, finest, F.O.B.	130s. to 144s.	120s. to 134s.	120s. to 132s.	134s. to 142s.	126s. to 136s.	150s. to 160s.	136s. to 148s.
Landed	126 ,, 146	116 ,, 136	120 ,, 134	134 ,, 142	124 ,, 138	.. ..	138 ,, 148
Cork, 1sts	142 ,, 150	133 ,, 137	136 ,, 142	143 ,, 150	138 ,, 143	158 ,, 160	145 ,, 150
,, 2nds	134 ,, 142	124 ,, 129	123 ,, 133	140 ,, 146	129 ,, 135	151 ,, 154	136 ,, 139
,, 3rds, new ..	122 ,, 125	106 ,, 118	100 ,, 106	122 ,, 123	111 ,, 116	131 ,, 132	108 ,, 109
,, 4ths	112 ,, 114	84 ,, 86	87 ,, 89	108 ,, ..	98 ,, 98	115 ,, ..	89 ,, 90
Limerick	128 ,, 132	112 ,, 116	110 ,, 114	.. ..	117 ,, 121	.. ..	118 ,, 120
Foreign:							
Friesland	112 ,, 142	106 ,, 116	112 ,, 122	130 ,, 138	113 ,, 130	136 ,, 144	134 ,, 136
Jersey, &c.	76 ,, 130	75 ,, 124	74 ,, 120	95 ,, 140	79 ,, 129	94 ,, 144	80 ,, 136
Kiel	110 ,, 156	100 ,, 140	112 ,, 146	130 ,, 148	111 ,, 145	135 ,, 164	.. ..
Normandy	.. ..	90 ,, 150	90 ,, 150	100 ,, 148	93 ,, 150	110 ,, 160	90 ,, 162
American	94 ,, 116	60 ,, 115	60 ,, 105	95 ,, 126	82 ,, 115	112 ,, 138	100 ,, 116

Cheese:							
English Cheddar, fine, new	.. ..	66 ,, 84	70 ,, 90	76 ,, 92	76 ,, 90	74 ,, 94	74 ,, 90
,, good, new	74 ,, 100	.. ..	.. ..	.. ..	74 ,, 93	.. ..	.. ..
Red Somerset Loaf ..	80 ,, 92	50 ,, 72	70 ,, 76	70 ,, 80	68 ,, 81	78 ,, 88	76 ,, 86
White or yellow Cheddar Loaf	80 ,, 92	60 ,, 70	68 ,, 80	76 ,, 80	72 ,, 81	80 ,, 88	76 ,, 86
Scotch Cheddar	70 ,, 80	60 ,, 70	66 ,, 76	68 ,, 80	67 ,, 77	74 ,, 82	64 ,, 76
Cheshire, new	78 ,, 90	70 ,, 84	70 ,, 84	78 ,, 85	76 ,, 87	84 ,, 88	76 ,, 86
,, good ditto ..	60 ,, 74	50 ,, 64	56 ,, 66	60 ,, 66	58 ,, 70	70 ,, 76	50 ,, 70
Wiltshire, new	64 ,, 84	64 ,, 70	66 ,, 76	68 ,, 80	67 ,, 78	70 ,, 82	62 ,, 78
,, good ditto	.. ..	50 ,, 60	56 ,, 60	60 ,, 66	57 ,, 64	66 ,, 68	.. ..
North Wilts Loaf, new	80 ,, 90	50 ,, 72	60 ,, 76	66 ,, 80	66 ,, 80	78 ,, 88	74 ,, 86
Derby ,, ,, ..	68 ,, 86	56 ,, 78	60 ,, 78	70 ,, 88	65 ,, 83	76 ,, 88	76 ,, 86
Foreign:							
American, fine	74 ,, 80	60 ,, 66	66 ,, 72	70 ,, 72	68 ,, 73	72 ,, 76	62 ,, 64
,, good	60 ,, 68	40 ,, 56	50 ,, 62	54 ,, 68	54 ,, 65	50 ,, 68	40 ,, 58
Gouda	50 ,, 64	40 ,, 64	50 ,, 64	56 ,, 66	49 ,, 64	52 ,, 60	56 ,, 60
Kanter	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Edan, new	54 ,, 70	50 ,, 70	52 ,, 68	56 ,, 68	53 ,, 68	54 ,, 64	56 ,, 68

Statement of the Quantity and Value of Butter imported from the United States, Belgium, France and Holland; and of Cheese imported from the United States and Holland, 1864–74.

Years.	United States			
	Butter		Cheese	
	Quantities.	Computed Real Value.	Quantities.	Computed Real Value
	Cwts	£	Cwts	£.
1864 ..	142,672	780,024	466,988	1,213,890
1865 ..	83,216	437,703	442,913	1,296,204
1866 ..	16,059	77,754	415,726	1,386,447
1867 ..	39,035	113,290	526,740	1,470,017
1868 ..	7,117	37,279	489,117	1,439,380
1869 ..	17,203	84,603	487,870	1,612,325
1870 ..	16,915	80,928	555,385	1,861,263
1871 ..	83,775	394,359	731,326	2,014,805
1872 ..	45,765	199,679	598,198	1,701,435
1873 ..	43,406	199,639	790,238	2,353,181
1874 ..	36,307	188,769	849,933	2,589,776

Years.	Belgium.		France.	
	Butter.		Butter.	
	Cwts.	£.	Cwts.	£
1864 ..	81,575	470,167	163,020	858,793
1865 ..	70,619	433,179	353,115	1,867,085
1866 ..	76,667	426,712	452,196	2,276,493
1867 ..	80,754	470,464	450,693	2,265,147
1868 ..	70,456	405,987	393,578	2,156,824
1869 ..	85,789	481,609	407,432	2,231,450
1870 ..	84,408	516,643	289,692	1,672,899
1871 ..	94,539	523,460	304,683	1,636,006
1872 ..	74,191	409,555	355,089	1,916,795
1873 ..	76,610	439,501	446,550	2,409,861
1874 ..	76,723	465,517	713,251	3,944,233

Years	Holland.			
	Butter.		Cheese	
	Cwts	£.	Cwts	£
1864 ..	336,224	1,774,462	336,831	881,972
1865 ..	345,026	1,886,486	386,962	1,100,037
1866 ..	383,225	1,979,070	426,559	1,317,231
1867 ..	326,217	1,733,459	332,628	961,245
1868 ..	343,322	1,992,414	329,565	959,547
1869 ..	415,176	2,253,420	426,913	1,262,101
1870 ..	406,795	2,388,459	422,553	1,204,830
1871 ..	390,616	1,986,708	348,148	954,236
1872 ..	269,091	1,358,579	329,535	942,537
1873 ..	279,004	1,453,875	336,654	1,013,233
1874 ..	351,605	1,877,755	398,888	1,164,921

JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

I.—*On the relative Profits to the Farmer from Horse, Cattle, and Sheep Breeding, Rearing, and Feeding in the United Kingdom.* By W. MACDONALD, Editor of the 'North British Agriculturist.'

INTRODUCTION.

THERE are few more popular agricultural subjects than the one of which this paper treats; but neither the time nor the space at my command enables me to furnish what might be termed an exhaustive report upon it. The more one studies the subject, the larger it grows. The Council of the Royal Agricultural Society of England resolved to devote a portion of the 'Journal' to the question, with the view of ascertaining, as far as possible, the cause of so many farmers giving up horse-breeding within the last fifteen or twenty years; the cause of sheep displacing cattle to some extent; and the reason of so many farmers, in comparatively recent years, ceasing to breed cattle, and buying in stores to fatten. Further, the Council were naturally desirous to ascertain whether the present scarcity and very high price of horses would not, in the opinion of practical men throughout the kingdom, warrant increased attention to the breeding and rearing of horse-flesh; whether, keeping in view the rise in the price of beef and mutton, the trifling advance in grain prices, and the growing demands of the British population, farmers might not, with profit to themselves and advantage to the community, produce more butcher-meat; and whether breeding and fattening could not, in these days of disease, be more extensively practised on the same holdings.

A comparison of the profits from horse, cattle, and sheep breeding, rearing, and feeding, applicable alike to all, or nearly all, parts of the United Kingdom, is almost an impossibility. Local and varying circumstances solve the question of whether this, that, or the other kind of stock is the most profitable. The nature of the soil, the climate, the situation of the farm, and other circumstances peculiar to the district, or it may be to the farm, must be consulted. I did not, therefore, undertake this inquiry and report in the hope of being able to show that British and Irish farmers would generally find it advantageous to abandon the production of any of the classes of stock referred to, and confine themselves to the other or others. Nor did I expect to find that, as a general rule, it would pay farmers to very materially increase their attention to one variety, if that involved the neglect or sacrifice of the others. I have, however, for several years been convinced that farmers would benefit by closer attention to the breeding and rearing of live-stock, especially cattle. Sheep during the last quarter of a century have been better managed in the United Kingdom than cattle; but on this subject more by-and-by. The result of recent inquiries confirms the belief that more beef and mutton could be raised in this country, with profit to the farmers and benefit to the community.

Live-stock farming, as a rule, has been much more profitable in the course of the last fifteen years than corn-growing; and it is likely to continue so. This circumstance is attributable to the superior quality of British beef and mutton; to the difficulties attending the import of good butcher's meat; and to the quality and quantity of the foreign corn which competes successfully in British markets with home-grown grain. British farmers turn a very much larger quantity of meat into the market annually than they did twenty years ago; but the appetite for it has more than kept pace with the growing supplies: hence the rise in price.

We have no means of comparing the home supplies of beef and mutton, prior to 1866, with those of more recent years. The agricultural returns, however, commenced by the Board of Trade in 1866, and since collected every year, give us at least a rough idea of our position. But they do little more; for the returns being optional, they are not so reliable as they might be. It is astonishing how many farmers, especially among the flock-masters, still decline to make returns. Latterly local Government officials have got from neighbours an approximation of the numbers owned by the non-returning farmers. This, however, is not satisfactory; and it is very desirable that more accurate statistics should be obtained.

Glancing at the Board of Trade returns, it will be seen that the total number of cattle in Great Britain in 1867 was 4,993,034, as compared with 5,337,759 in 1871, and 6,012,824 in 1875. The head of cattle has thus materially increased during the last eight years. In fact, these figures show an increase of fully one million head, or about one in six. The total of last year is the highest on record, excepting that of 1874, which was greater by 112,667. It is more than likely that the actual increase of cattle has been less since 1867 than these figures represent. Some allowance must be made for the fact that a suspicion, at first entertained by many occupiers, that the statistics might lead to more taxation, gradually disappeared to a considerable extent, and so more schedules were annually returned. Taking this into account, I do not believe that we have 17 per cent. more cattle in Britain now than we had eight years ago. With so much encouragement in the form of a growing demand and substantial rise in price, more numbers were to be expected, and have unquestionably been kept, though somewhat mysteriously a decrease is noted during the last twelve months. Possibly, also, the increase in numbers is not more marked, even in the course of the last ten years, than the improved condition and heavier weights of the animals sent to the fat market. This is the result of more attention to the feeding, and especially the "finishing" of the cattle, on which, however, I hope to be able to show there is yet great room for improvement in many parts of the country.

Most practical farmers will be prepared for the statement that the advance in numbers has not been quite so great in Ireland as in Britain in the period referred to. Nevertheless, the increase in the Emerald Isle has been considerable. In 1867 the head of cattle in that country amounted to 3,707,803. In 1871 it was 3,976,372, and last year, 4,111,990. The increase has been chiefly since 1870. The total number of cattle returned in the United Kingdom in 1867 was 8,731,473, as against 10,124,814 in 1875.

The agricultural returns, curiously enough, do not indicate such an increase of sheep as of cattle, either in Great Britain or Ireland, though it is well known that in many districts sheep have lately done better than any other kind of stock, and have taken, to some extent, the place of cattle. In 1867–68 the greatest number of sheep is recorded, both in England and Ireland. From 1866 to 1869 the numbers were higher than for any corresponding period since. This was due principally to the unfortunate and destructive visitation of rinderpest in 1865–66. After that, for a time, farmers in many localities turned their attention to sheep, which rose in price to an exorbitant point. By 1870, however, cattle were again on the ascendant, and sheep, though of fair value, were much lower than in 1866–67. Since then sheep-markets have varied rather more than cattle-fairs, and the fleecy tribe has not increased in numbers so notably as cattle. Indeed, in Ireland, the head of sheep is less than it was in 1869, though about as great as it was from 1870 to 1873.

Of sheep in Great Britain there were, according to the annual returns, 28,919,101 in 1867, and 30,711,396 the following year. The decrease was steady, until only 27,119,569 were returned in 1871. The next three years there was a gradual advance, which brought the total to 30,313,941 in 1874. Last year, however, the number had receded by 1,147,802. Ireland in 1867 had 4,826,015; in 1871 it had 4,228,721, and in 1874 the numbers were 4,437,613 as compared with 4,248,158 in 1875. The total number of sheep returned in 1875 in the United Kingdom was 33,414,860.

Horses in Great Britain decreased considerably between 1869 and 1873. The numbers in the former year were 1,461,061, and in the latter, 1,276,444. This number was some 20,000 more than in 1872. Stimulated by the extraordinary prices obtainable the last few years, farmers have resorted to breeding; but though the horse-stock is getting numerically stronger year by year, it is still under the figures of 1869. Last year there were 1,340,129 horses returned. In Ireland horses became more numerous from 1869 to 1872; but since then there has been a diminution. The first-mentioned year had 527,248 horses: the last, 540,745. By 1874 the numbers were reduced to 526,587, and in 1875 to 526,160. The total for the United Kingdom last year was 1,866,289.

Though pigs do not come within the scope of my report, it may be mentioned that they are not now so plentiful either in England, Scotland, or Ireland, as they were nine years ago, according at least to the only available statistics; though in Ireland there was last year an increase of 150,049 on the numbers of 1871.

The quantity of beef and mutton annually produced in this country has increased greatly within the last thirty-five years. The following statistics (p. 5), of the number of cattle shown, and the prices obtained at the London Christmas-market, will give some indication of the progress which beef-producing has made, and of the great advance which has taken place in prices.

The rise in numbers, it will be seen, was steady, with a few exceptional years, from 1841 to 1863. In the latter year there was an excessive supply, and in consequence many unsatisfactory results were obtained. Since that year the display has

Year.	Beasts.		Year.	Beasts.	
		s. *d.* *s.* *d.*			*s.* *d.* *s.* *d.*
1841	4.500	3 8—5 0	1859	7,560	3 6—5 4
1842	4,541	3 4—4 8	1860	7,860	3 4—5 6
1843	4,510	4 8—4 4	1861	8,840	3 4—5 0
1844	5,713	4 0—4 6	1862	8,430	3 4—5 0
1845	5,326	3 6—4 8	1863	10,372	3 6—5 2
1846	4,570	4 0—5 8	1864	7,130	3 8—5 8
1847	4,282	3 4—4 8	1865	7,530	3 4—5 4
1848	5,942	3 4—4 8	1866	7,340	3 8—5 6
1849	5,765	3 4—4 0	1867	8,110	3 4—5 0
1850	6,341	3 0—3 10	1868	5,320	3 4—5 8
1851	6,103	2 8—4 2	1869.	6,728	3 6—6 2
1852	6,271	2 8—4 0	1870	6,425	3 6—6 2
1853	7,037	3 2—4 10	1871	6,320	3 10—6 2
1854	6,181	3 6—5 4	1872	7,560	4 6—6 0
1855	7,000	3 8—4 2	1873	6,170	4 4—6 6
1856	6,748	3 4—5 0	1874	6,570	4 4—6 8
1857	6,856	3 4—4 8	1875	7,660	4 4—6 6
1858	6,424	3 4—5 0			

diminished perceptibly, though for the last six or seven years it has not varied beyond a few hundreds. When the supply was very large, as a rule, the prices were lower. This induced feeders not to send so very extensively to one market, as some of them were in the habit of doing a dozen years ago. They naturally dreaded a glut, and have sent more of their stock to market either the weeks preceding or succeeding Christmas; more frequently the former. Of course the growing practice of sending large quantities of dead meat from Aberdeen and other parts of Scotland to London, as well as the opening of the Foreign Cattle Market at Deptford in 1871, affects to some extent the numbers of live stock at the great Christmas-market.

The advance in price, shown by the above figures, has been steadier, and just about as great as the increase in numbers. The average price in 1841, sinking offal, was about 4*s.* per stone of 8 lbs., or 6*d.* per lb.; while last Christmas it was nearly 6*s.*, or 9*d.* per lb. The difference in the common beef prices between the two periods is greater even than is represented by these quotations. At the earlier date, the quality of the Christmas-market lots was further ahead of that of the general supply throughout the year than is now the case. The choicer lots are, no doubt, still reserved for the great Christmas-market; but they are not now so much superior to the animals disposed of at other markets as they were formerly. Reference to reports of the principal British markets in the month of June for the last thirty years shows a greater advance in prices than is indicated by the Christmas-market returns. So far as I have been able to make out from access to those market reports, the following were about the average current rates:—

	Beef per lb.	Mutton per lb.
	d.	*d.*
1849	4½	5
1851	4¾	5
1855	6¾	6¾
1859	6	6½
1864	6¼	6¼
1868	7	7½
1871	8	8½
1875	8¾	9

These are, of course, the estimated average prices paid to the feeder or his representative for the live animal. It need scarcely be added that the consumer has had to pay a great deal more for the dead meat; and in many quarters it is believed that the margin between the live-stock prices and the cost to the consumer is larger than it should be. There has of late years arisen a very extensive and prosperous business for "middlemen." Formerly the butcher transacted business with the farmer or feeder, except in the principal or metropolitan fat markets. Now we have live-stock marts in almost every district; and the stock, with a few isolated exceptions, go through the hands of salesmen, who make a very nice thing of it from one end of the year to the other. That, however, is their luck; for it seems that, owing to the change that rural affairs have taken, there is no other way of disposing of the greater proportion of fat stock in this country. On the whole, it can scarcely be said that the farmers have much reason to regret the change; but keeping in view the retail prices, under which many consumers have groaned during the last few years, it is not surprising that that very large and growing class should complain.

There has been, as everybody knows, a great increase in the British population during the last thirty years; but the enhanced demand for butcher's meat is not nearly gauged by that increase. There are, perhaps, three persons eating animal food nowadays for two thirty years ago, such is the change in our mode of living, which is especially great in the rural districts. It is possible that, as some wise people assert, the British public consume more butcher's meat than is really conducive to their health. Be that as it may, there is no likelihood of a sensible falling off in the demand for that sort of food. On the contrary, there is every prospect of an increase, perhaps even in a greater ratio than that in which the population advances. Then the foreign producers cannot compete advantageously with the British feeders. These and other facts make the production of beef and mutton the British and Irish farmers' sheet-anchor. Some dead meat was received from abroad before 1842, but the introduction of foreign live animals into the United Kingdom dates from that year. For the first ten years the increase of foreign stock landed in Britain was slow; indeed very little progress was made until 1864, when more were imported for a few years. Again, from 1868 till 1874 there was very little increase. In 1875 the numbers of foreign stock landed in the United Kingdom were swollen considerably, and are larger than in any previous year, notwithstanding the complaints raised in certain quarters that present restrictions are ruinous to the foreign trade. By the way, the importation of pork, bacon, and hams, is now, and has for some years been, on a much larger scale than it was less than twenty years ago. The following statistics (p. 8) show the progress that the importation of cattle, sheep, and pigs has made, and also the increase in the salt beef and pork, with the bacon and hams, received from abroad.

The immense increase in the quantity of bacon and hams imported within the last three or four years raises the foreign percentage of food now consumed in this country higher than I have hitherto seen it estimated. From calculations which I have endeavoured to make I find that, including the bacon and hams, the foreign stuffs would amount to nearly 14 per cent. of the meat consumed in the United Kingdom. Excluding the bacon and ham, however, and reckoning only what comes in the form of live cattle, sheep, and pigs, and under the description of "beef" and "pork," I have made the foreign proportion about 6½ per cent. Of course, in the absence of thoroughly reliable statistics as to the number of cattle, sheep, and pigs killed in this country annually, as well as their weights, my estimates must be regarded only as an approximation to the actual quantity of meat furnished yearly by British and Irish feeders. I calculated that one-fourth of the cattle returned in the United Kingdom were killed annually, which would give 2,531,201 animals, and estimamating their average weight at 6 cwt. 1 qr. each, we have 15,820,006 cwts. of beef. Of the 33,414,297 sheep returned in the United Kingdom, I reckoned that 5-12ths were only once enumerated, or, in other words, went annually to the knife. Assuming that the average carcase is 70 lbs., the 5-12ths of the total number of sheep give us 8,701,451 cwt. of mutton. Supposing that as many pigs as are returned are killed annually, and calculating the average weight at 10 stone, we have 4,348,941 cwt. of pork. This makes a total of 28,870,398 cwt. of butcher's meat annually supplied by our home herds and flocks.

Table showing the Number of Cattle, Sheep, and Pigs, and the Quantities of Bacon and Hams, Salt Beef, and Pork imported into the United Kingdom in each year from 1840 to 1875 inclusive.

	1840.	1842.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.
	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.
Cattle	..	4,264	93,061	125,253	114,338	97,527	83,306	92,963	89,001	85,677	104,569	107,096	97,887
Sheep and Lambs . .	..	614	230,037	259,420	183,436	162,642	145,059	177,207	184,482	258,580	320,219	312,923	299,472
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Bacon and Hams . .	8,355	..	81,436	205,677	423,510	241,494	372,793	366,934	196,685	107,251	326,106	515,953	1,345,694
Beef	30,022	..	124,693	183,285	192,274	230,755	187,838	151,174	168,558	219,589	262,194	152,635	189,761
Pork	29,532	..	95,555	152,731	160,898	204,326	156,266	88,752	89,765	163,330	173,325	136,416	227,758

	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.
	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.
Cattle	150,898	231,733	283,271	237,739	177,948	136,688	220,190	202,172	248,611	172,993	200,887	193,862	263,698
Sheep and Lambs . .	430,788	496,243	914,170	790,880	539,716	341,155	709,843	669,905	917,076	809,822	851,035	758,902	977,863
Swine	..	..	..	..	48,079	33,721	69,067	95,624	85,622	16,101	80,976	115,389	71,928
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts	Cwts.	Cwts.
Bacon and Hams . .	1,877,813	1,069,390	713,346	635,782	537,114	638,127	740,193	567,164	1,093,838	2,001,855	2,973,314	2,541,691	2,898,293*
Beef	283,369	346,821	244,431	232,984	195,797	240,577	214,955	203,713	279,179	193,215	218,563	231,532	216,516
Pork	170,751	223,015	222,419	205,282	142,831	144,379	165,944	220,533	266,967	212,382	266,084	297,238	..

* This includes Pork.

The 263,698 bulls, cows, oxen, and calves, which came from foreign countries in 1875, were supposed to weigh 4½ cwt. each, which gave 1,186,641 cwt. in meat. The 977,863 sheep were calculated at 13 lbs. per quarter, which represented 454,007 cwt. Then, from 71,928 live pigs, as many cwt. were relied on. Thus we had 1,712,576 cwt. of meat from abroad in the form of live cattle, sheep, and pigs in 1875, which amounts to nearly 6 per cent. of the food consumed, excluding ham, bacon, pork, and cured beef. The latter, or dead meat, represent about 8 per cent. of the total consumption.

No allowance was made for the number of calves dropped in early spring, and fed off as veal, before the enumeration takes place; nor were the lambs which are turned into the fat market before the 25th of June taken into account. No deduction, however, was made for loss of beef or mutton by disease and death; but the lamb and veal would, roughly speaking, meet any deficiency of this sort. Of course, many pigs live longer than twelve months; but there are also a large number killed under eight months which have never been enumerated, so that I am inclined to think that the whole number returned does not represent the actual head of pigs annually slaughtered. The average weight of 10 imperial stone, however, may be rather high. It was assumed also that all the foreign cattle were for slaughter. That is not quite the case; but the number of them enumerated in the British returns is infinitesimal.

The total of 33,697,783 cwt. of beef, mutton, pork, hams, and bacon represented as consumed annually in the United Kingdom, amounts to about 114 lbs. to each man, woman, and child in the United Kingdom—that is, estimating the population at 33,000,000. If the quantities of poultry, of fish, of game, and rabbits annually eaten are taken into consideration, in addition to the above, it will be seen that in a large degree we are an animal-food consuming community.

In order to obtain the opinions and experience of leading practical men throughout the United Kingdom on a subject of such vast importance, I issued, with the editor's approval, a series of queries to gentlemen resident in various parts of England, Scotland, and Ireland. The queries were addressed to, and replies solicited from, gentlemen who were known to have had extensive experience, and whose opinions on such matters generally command respect and often also approval. From more than one-half the number applied to no replies have been received, which is perhaps not surprising, considering the difficulty of giving comprehensive and definite answers to such questions, and the well-known disinclination of many of the best practical farmers o put their views on paper The questions were framed with a view to elicit information concerning the extended breeding and rearing of live-stock; on the farming circumstances under which horse-breeding would pay; on the circumstances which render sheep more profitable than cattle, and *vice versâ;* on the circumstances in which buying of store-stock to fatten is preferable to breeding a portion, or the whole, of the supply; and on the breeds of horses, cattle, and sheep which are best suited for the different districts, as also for the country generally.

Nearly 100 replies have been received, most of which contain matter worth recording in this 'Journal.' To the gentlemen who kindly made these contributions—many of them evidently at considerable trouble, and occasionally, no doubt, inconvenience—I feel indebted, and so must the readers of the Report. A perusal of the replies will show a wonderful degree of unanimity on the various points under consideration. The difference of opinion being so trifling, one might infer that the business of the production of beef and mutton is well understood in this country. The knowledge and the practice, however, of the gentlemen whose names will be found in the Report are, I fear, above average. It may fairly be assumed that a large proportion of British and Irish farmers, either from youth or other causes, are not so well informed on the various farming conditions which favour the production of a particular kind of stock. Hence it comes, that while the replies cannot fail to prove interesting reading to even the more experienced agriculturists, they will be especially instructive and useful to many, whose opportunities of acquiring sound practical information have hitherto been limited.

It would have been very desirable, no doubt, to have had the various views and experiences supported by the publication of a few carefully kept farm accounts—to have demonstrated, by annual balance-sheets, which kind of stock was most profitable. This, however, I have been unable to obtain. I could have got a few, but not the more representative ones; and so I gave up the idea, preferring to want one item, important as it was, rather than run the risk of misleading. Though I promised that names and addresses would be suppressed in connection with the accounts, the following quotation from a letter, received from one of the most talented and accomplished farmers in Britain, to whom I applied, will indicate the difficulties with which I had to contend:—"Why should it be thought warrantable to use a liberty with men engaged in the business of farming, that would be treated as an impertinence or outrage in all other cases? Farmers have long been honourably distinguished for the frankness and willingness with which they have given to other farmers the benefit of their professional knowledge and experience. This frankness has not unfrequently been grossly abused, and it is this very habit of theirs which has betrayed you and others into the expectation that some of them will be found willing to disclose their whole business transactions for the benefit of the public." It is not very evident wherein "this frankness has been abused;" but I shall not discuss a matter of that kind, and now append the replies, which are as nearly as possible in the words of the writers. It should be explained that the somewhat disjointed form in which most of the reports read is due to the fact of their having been replies to a series of ten queries. I need not here print the queries, as the general drift of them may be inferred from the nature of the appended replies.

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1. Honingham-Thorpe, Norwich.

This is essentially a corn-growing district, with so little grass land that to rear a large number of horses or cattle is impossible. The climate is too dry for second year's seeds, but the growth of sainfoin is extending, and that enables farmers to keep more sheep. Indeed, attempts are continually being made by occupiers of stiff arable lands, and also by farmers with no permanent pasture or sheep-walk, to keep a flock of ewes, but I notice that an exceptionally dry summer or cold spring, a very long winter, the failure of a root-crop, or the prevalence of foot-and-mouth disease among sheep, will often cause these farmers to revert to their old system of buying-in sheep or lambs to consume their clover, turnips, &c.

No doubt a few more cattle are reared. Almost every small farmer who keeps a cow brings up her calf, and in some instances calves are sent from the dairy districts and weaned on a little milk, with linseed and other substitutes. But it is found more profitable to buy some young growing stock, which mostly come from Ireland.

The sheep best suited to the district are half-breds, a cross between a good Black-faced or Down ewe and a Long-woolled ram. This is the class of lamb mostly produced in Norfolk; but several Oxford Downs and half-bred flocks are kept, and probably are extending in consequence of the difficulty and cost of procuring good Down ewes for renewing the flock.

I consider that a man to successfully breed nags should really understand horses. Few men do, although it is a common delusion to fancy yourself a good judge of horse-flesh. It is much easier to breed a decent cart-horse; and many more are reared in Norfolk, and of a better class, than was common a few years ago. Still, unless a farmer has some rough pastures or low marshes to stow his colts in summer, rearing a quantity of cart-horses is attended with much difficulty.

A good, but not *too-finely* bred Shorthorn, is the bullock most preferred by the Norfolk grazier; but the Improved Red-polled Norfolks make useful dairy cows, and they graze fairly well at two and three years old.

One great drawback to extend the quantity of stock in Norfolk is the constant presence of contagious diseases. As we import nineteen-twentieths of the cattle we feed, and they come from all parts of the United Kingdom, if there is any infectious disorder in any part of these islands it is sure to find its way to Norfolk. The ravages of pleuro-pneumonia are more extensive than in any other district, and the county has hardly been entirely clear of foot-and-mouth disease since the removal of the Cattle Plague restrictions, which kept Norfolk free from that scourge for upwards of two years.

Clare Sewell Read.

2. EDINGTON MAINS, CHIRNSIDE, N.B.

Instead of a categorical reply to your questions, I think it better to offer some remarks which will have a general reference to the matter embraced by them. Perhaps I cannot do this more effectively than by narrating some of the changes in cattle-husbandry that have taken place in Berwickshire within my own recollection. Sixty years ago every arable farm, with trifling exceptions, had its annual bare fallow-break; and the growing of turnips was confined to the naturally dry soils. Even on these, this crop was still further restricted by the want of any extraneous supply of manure. At that time the number of cattle bred and reared in the county was very much larger than it is now. For the most part, these cattle left the district as two-year-olds; part of them direct to the butcher-market, but a large portion of them to be fattened off in the rich pastures of the midland counties of England. Many of them were very fine cattle. I know that my father sometimes turned out a lot of two-year-old steers that averaged 70 stone, imperial, each. However, the county, as a whole, then reared more cattle than it could fatten. The introduction of bone-manure, soon followed by tile-draining, has wrought a complete revolution in our husbandry. Bare fallow has all but disappeared, and a fifth part, at least, of the whole arable land is annually under turnips. Not only so, but the weight of the root-crop per acre is now very much greater than formerly. Still further, the cattle were then fed on turnips and straw only. Now the use of linseed-cakes and other extraneous feeding-stuffs is universal. As the result of these changes this county now annually sends to market at least four times more cattle and three times more sheep than it did sixty years ago; and it sends them direct to the fat market. With the aid of its Lammermuir grazings, the county still more than supplies its own requirements in sheep; but as regards cattle, I suppose that at least five-sixths of its annual cast are bred and partly reared elsewhere. Our farms now produce winter food for a much larger number of cattle than our pastures can keep in summer. Happily for all concerned, these conditions are exactly reversed in the districts from which our supplies of young cattle are chiefly drawn. In ordinary seasons, during August and September, when our pastures are parched and bare, and we are at our wits'-end to know how to keep our stock from falling off, one has but to visit the dales in the north-west of England to find the pastures and eddishes full of luxuriant grass and thriving cattle, with an all but total absence of corn and turnips. A few weeks later in the autumn the Dalesmen are glad to dispose of their surplus cattle to the arable farmers of Tweedside and Lothian, who then need them to consume their turnips. Climate being a condition beyond human control, these parties do well each to pursue the system best adapted to their respective circumstances. Another all-important element in determining the question whether the turnip-growers of the eastern counties should breed their own cattle or buy them in as stores, is the rent of land. This is so much greater per acre in the case of the fertile arable lands of the eastern counties than in that of the rough pasture lands of the north of England, that an increase in the market-value of a store bullock that would leave a good profit in the latter districts, might leave no margin at all in the former. As a matter of fact, the farmers of our best turnip-growing districts have, for the past thirty-five years or thereabouts, found it more profitable to buy young cattle than to breed them. As this fact became apparent, they ceased to breed on the same scale as they had formerly done. As practical men of business, they changed their system to meet altered conditions; and of course will do so again in whatever direction and to whatever extent the element of profit guides them. The weakest point in our present system is in the *quality* of our bought-in cattle. A very large proportion of them are of a mongrel and inferior breed, and a still larger portion have sustained irremediable damage from pinching and starving during their first winter. Could we get the ear of the breeders, our constant counsel to them would be, "use better bulls," and "be kinder to your yearlings."

Very important changes in the sheep-husbandry of Berwickshire have also taken place in my day. Forty-five years ago every lowland farm had its flock of Leicester ewes; and now, with the exception of a very few kept for ram-breeding, there is not such a thing. About the time referred to, a cross-breed betwixt Cheviot ewe and Leicester ram was universally substituted for the pure Leicester. This change was due in part, and particularly when it was first adopted, to the fact that ewes of this cross were found to be hardier and more prolific than Leicesters; but from the first it was due in part, and always the more so as years passed, to a change in the taste of our best customers—the miners and mechanics of the north of England. At the earlier period named, the largest and fattest mutton pleased them best; whereas now the article that is in demand is a carcase weighing about 20 lbs. per quarter, and with a large preponderance of lean flesh. For several years, sheep of the first cross betwixt Leicester and Cheviot, or Leicester and Black-faced, have been worth 1*d.* per lb. more than those with two or three crosses of Leicester blood, and a consequent larger proportion of fat meat. Farmers, like other traders, have to consult the taste of their customers; and hence their practice in sheep-breeding is not altogether left to their own choice. In southern England, the mutton of Downs and their crosses obtains a similar preference to that of the larger and fatter long-woolled kinds. The most important change, however, has been in the earlier age at which nearly the whole of the sheep bred in this county are now sent to market. Formerly they were either disposed of in autumn, when about 18 months old, to be fattened in England, or kept on until two years old, and sold fat after a second winter's feeding on turnips. Since the practice of slicing turnips for the hoggets, and of giving cake or grain along with roots, was adopted, they have gone to market at from 12 to 15 months old.

Like most Berwickshire farmers, I have always tried to breed as many cart-horses as would maintain my own stud in efficiency; but I am sorry to say that I find it increasingly difficult to accomplish this, although the great rise in the price of horses makes it more than ever desirable to do so. The difficulty arises from the want of good stallions. Of recent years there has been a great falling off both in the number and quality of the stallions that travel for hire in this county. The temptation to over-tax the procreative power of such animals in the attempt to secure a large revenue from them is so great, that, as a rule, a very large proportion of the mares served by them are unfruitful. Besides the direct loss of money in the fees paid for such useless services, the disappointment is so vexatious, that many farmers have given up the attempt at horse-breeding altogether. The effectual remedy for this evil would be for a score or so of farmers in every neighbourhood to club together and keep a stallion for their own exclusive use. Until some step of this kind is taken, we shall fail to breed horses enough to supply our own wants, or to have them of the best quality. These remarks, however, have reference only to the breeding of horses for home-supply. There are other considerations, altogether, that deter men from going into horse-breeding as a regular source of farm revenue. In order to send to market an annual cast of 4-year-olds, you must have the same number of brood-mares, yearlings, 2-year-olds, and 3-year-olds, on hand the year round; each of them, on the average, consuming as much food, requiring more accommodation and attendance, and involving far greater risk, than the same number of bullocks, or an equivalent number of sheep. As a rule, the occupiers of good arable land will always prefer the quick and safe returns from sheep and cattle, to the longer keep, greater risks, and far greater labour, anxiety, and skill, requisite for successful horse-breeding. Such, at least, is the opinion of

JOHN WILSON.

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3. TIPTREE HALL, ESSEX.

The question whether we should breed or purchase our live-stock is dependent on a variety of conditions, such as:—a proper knowledge of live-stock management; the quality of the soil, and description of its productions; the climate; and shelter. In Essex and in Suffolk it is a common practice for a farmer to breed sufficient colts to keep up the necessary horse-power. Pigs are also very generally bred on the farms in some districts. Sheep are bred to sell as lean stock. In this case the land becomes less capable of producing abundant corn-crops, unless much cake or imported food and manures are used.

My own practice is to breed my sheep; crossing Hampshire Down or Suffolk Down ewes (with dark faces), and a Cotswold or Lincoln well-bred ram—the latter I prefer. The lambs thus bred are well fed from their early age, the ewes also always having rape-cake. By keeping the lambs in a growing and fattening condition they are usually sold fat at 12 months old at prices varying from 60*s.* to 73*s.* each, according to market-price. I consider that fat stock makes fat crops; lean stock, lean crops.

My experience is that animals bred on a farm thrive better than when imported. Lean animals cannot, for some time, stand good high feeding. They are also more subject to disease and loss than those bred on the farm, and well fed and cared for from their youth. I never could do well with purchased sheep. Of course, when we purchase, the prices may be very cheap or very dear, according to weather and supply of natural food.

I never breed from crosses, but have pure blood on each side. My ewes are kept for several years, and then fattened under cover in sheds. Although I have only 6 acres of natural pasture, I generally keep about 80 ewes, and get 120 lambs on this farm of 175 acres, landlords' measure. Both our sheep and lambs are always folded within iron hurdles on wheels, the ewes following the lambs. The fold is removed every twelve hours. A variety of food is prepared and carried to the sheep and lambs daily, in addition to that on which the fold is made. Thus the land and the sheep are both in fattening condition.

About three weeks or a month before parturition the ewes have a run in a small pasture, but are enclosed in yard and shed at night when cold.

In breeding stock, as in every other business, the difference between good and bad management regulates the profit or loss. I used, before the cattle-plague, to wean, rear, and fatten 30 calves annually, buying them from the breeders at about 3 weeks old. Now I purchase them from farmers at 9 to 12 months old. In my case breeding, fattening, and corn-growing, go on concurrently.

I do not pay fancy prices for stock. I am a great believer in the advantages of good and suitable food, and under cover-shelter during the six cold months, with long nights and short days. I do not consider much area of permanent pasture necessary for breeding stock, provided we so intermix our various feeding-stuffs, and artificial green and root-crops, as to suit the growth and condition of the animals. We should endeavour to imitate nature, which, in good permanent pastures, supplies a great variety of plants, having different and peculiar properties, and periods of ripening. In fact, good grass hay illustrates practically my meaning: for it is an admirable admixture, and acceptable to live-stock. We can imitate this, to a great extent, by varieties of other food.

As regards sheep, I get by the white-faced and long-woolled Lincoln or Cotswold ram, and the dark-faced short-woolled ewes, a lamb with shaded-face, giving both wool, and lean and fat meat. White-faced mutton is not liked by our butchers. I have a most decided objection to exposing hairy animals during the inclement months; they should always have access to comfortable shelter. Even with sheep, shelter during very severe weather is desirable. I find that our old, worn-out, scraggy ewes fatten well in covered and enclosed sheds with paved floors, their food being mixed and prepared.

I have no experience in horse-breeding, but, from observation, I consider that their very activity renders them more liable to accident than cattle.

But the same principles of proper food and shelter apply to them as to cattle. Breeding-ewes require a great variety of suitable food to form their progeny before parturition, and a certain amount of liberty for exercise is advantageous to them, as well as to cows and mares.

Building up an animal is like building a house; there must be a variety of materials—such as a good pasture furnishes. Parentage has much to do with profit. It is a great mistake to breed from inferior parents to save a few shillings—especially on the male side; I have seen too much false economy in this respect.

J. J. Mechi.

4. Wallstown Castle, Shanballymore, Mallow, Ireland.

I think breeding of horses, cattle, and sheep might be extended with advantage.

On purely tillage farms, or where a regular rotation of cropping is carried out, or where from circumstances a fixed minimum number of horses are engaged to do the requisite work, breeding-mares, as a matter of course, cannot do the constant work of geldings or barren mares. Where breeding is to be carried out an extra number of horses must therefore be kept. On farms where a large portion is under grass the busy times will only occur at seasons when the breeding-mares can be spared. By having an extra strength of horse-power the crops can be got in quickly in spring, and before the mares foal. The summer-work can then be got through by the other horses on the farm. As a regular course of cropping, as a rule, is not carried out in Ireland, the small farmers could with advantage put one of their mares to breed.

When the greater part of the farm is under the plough, and when the dairy would not be profitable, or where the pasturage is sufficiently rich to fatten the cattle grazed thereon, I consider it more economical to buy store stock than to breed them. In all other cases I would be in favour of home-breeding.

As to sheep, when the pasture is well adapted for fattening, or when, as in the case of purely tillage farms, or on clay farms, and land liable to be winter-flooded, buying stores would be more advantageous than breeding.

I have never known breeding horses on a large scale to be profitable, nor, indeed, the keeping of breeding mares for breeding purposes alone; but a mare, or two or three in proportion to the size of the farm, taking a turn at the plough, and carting in the busy season, is very profitable. Good mares of this class often bring in from 40*l.* to 80*l.* for three-year-olds off the grass. If breeding is to be adopted on a large scale it would necessitate considerable outlay in the way of paddocks and stabling. A large number of colts kept together would, in their frolics, cut up and destroy the pastures. Nor can they be driven together and housed with the same safety as cattle. Hacks and agricultural horses are in proportionately far better demand now than hunters and racers. Except on a small scale, cattle- and sheep-breeding are preferable to horse-breeding.

I have known several farmers from time to time give up horse-breeding on a large scale as unprofitable.

I have known some go largely into horse-breeding, but they all returned again to cattle- and sheep-breeding. Several farmers of my acquaintance have changed from extensive cattle-breeding to sheep-breeding, and *vice versâ;* but as soil and situation are the governing points in this consideration, it is plain that as sheep naturally delight in the high and dry lands, and the cow in the plains, any great deviation from this natural order of things will ultimately entail loss on a farmer who persists in carrying it on.

There has been a class of mare in Ireland from time immemorial which may be called half-bred, still she is nothing like what you could produce between a Clydesdale or Suffolk mare and a race-horse; in that case the strain would be too great, and you would be sure to obtain no symmetry; but the Irish mare proper is stout, without much hair on the fetlocks, with good ribs, shoulders a good deal slanted, and a sweet, though not small head. This class of mare is equal to about a ton or 25 cwt. on all the highways, and can trot with ease about 6 miles an hour, returning with the empty cart. She is found the most valuable in Ireland for general purposes. Put to a racer, she breeds a capital hunter; to a Clydesdale or Suffolk, she throws a valuable heavy cart-horse; or to a stallion of her own class, she produces a useful animal, quite saleable, but not so likely to fetch as high a price as if crossed with such horses as above mentioned. In cattle the cross with the Shorthorn has no equal. In sheep the Border-Leicester and Shropshire Down are the favourites. In Tipperary, the Lincoln cross is much esteemed. There are also some good flocks of English Leicesters, and Roscommons or Irish sheep; still the Border-Leicester is most common, and next to that the Shropshire Down. The former prevails in North Cork and the latter in South Cork. A cross between both produces a very profitable animal.

JAMES BYRNE.

5. WARLABY, NORTHALLERTON.

Referring to your questions generally, I should say that so very much depends on situation, climate, and nature of soil on a farm, that it would be impossible to lay down any rule for a district like mine, where there may be found as fine grazing-land as in any part of England, as well as a large portion of inferior and bad clays.

Sixty to seventy years ago (taking an area of 15 to 20 miles round) this district was the nursery, in which were bred those herds of Shorthorns whose descendants have since obtained such a world-wide reputation; but as one well-known breeder died off after another, these herds were dispersed, and now not a breeder remains where there were ten before.

The cause of this change may, I think, be found in the fact that comparatively few farmers at the present day care about breeding the stock for their farms, and thus the best land is all used for fattening; the inducements to feed cattle, owing to the high price of beef; the ready means of obtaining a supply of cattle for feeding; and the comparatively small risk of loss from disease, as compared with that from breeding.

Nearly the whole of this district is grazed by Irish cattle, in which a wonderful improvement has taken place during the last twenty years, through the introduction of Shorthorns into Ireland from the very district which is now taking back immense supplies of Irish-bred cattle for the purpose of feeding.

Would it pay the farmer better to breed his own? I am strongly of opinion that it would, and whenever opportunity occurs I endeavour to impress that opinion upon my neighbours. On the poorer land, which is generally in small farms, breeding and rearing cattle are carried on; and considering the high price of butter and store stock, which this class of farmer has to dispose of, I should say that it is far more profitable than grazing. It is among this class of farmers of poor land that many half-bred horses are bred, perhaps in some measure for the reason that they can be raised at a cheap rate, whilst they will not pay for grazing on good land. I cannot think that there are fewer horses bred at the present day than formerly, but it is very possible that horse-breeding, which for many years was barely remunerative, owing to the low price fixed by Government for the supply required by them, has not increased in proportion to the demand, for I should think twenty men drive a horse now where one did formerly. As to sheep, many farmers of the best land do not like them among fattening stock on their feeding-land, so they prefer to buy-in their stocks of grazing-sheep as they may require them either for grass, clover, or roots. Others, again, on a worse class of land breed sheep and run them with their store stock. Undoubtedly, breeding has paid best of late years; wool and mutton having been at such remunerative prices, whilst graziers have had to pay dearly for their lean stock, and run the risk of fluctuating markets.

THOS. C. BOOTH.

6. TILLYFOUR, ABERDEEN.

IN some cases British farmers could breed more cattle and sheep than at present; but in other cases they could not do so with profit. An expensive stock of breeding cattle is invariably a great risk. Some men are very fortunate with breeding-stock, and others are not, and the latter generally breed to a loss, or, at any rate, to no profit. If a farmer has the misfortune to rent land which is not healthy for a breeding or young stock, or if he cannot give pretty close personal attention to them, or does not know much about stock, he is safer to buy stores to consume the root and straw-crops than to breed for himself.

I do not breed horses nor sheep, so I cannot give a very reliable comparison; but in Aberdeenshire generally, cattle are the most profitable to graze and feed, especially on our best land. The poorer land ought to be grazed with either small Black-polled or West Highland cattle, or with sheep. I have not known of any farmer who formerly bred sheep extensively, now rearing cattle instead; but some farmers of my acquaintance have, since the Rinderpest in 1865–6, kept a mixed stock of sheep and cattle. I have done so myself, and to a profit. I highly approve of such a stock where the farm is composed partly of good land, and partly of inferior.

I believe that for commercial purposes the polled Aberdeen and the cross-breds are the best, and are the only real rent-paying kinds of cattle in this county, and that Blackfaced sheep are best suited to our cold, wet climate. It is a mistaken notion that we cannot make our black cattle prime fat at two years old. I have six-quarter-olds just now quite fit for the butcher.

WILLIAM McCOMBIE.

7. RICALL HALL, YORK.

When the land is well managed, the arable soils thoroughly drained and highly cultivated; when farmyard-manure is supplemented by artificials, and foreign food freely used; and when the grass land is not treated as though it was capable of supporting itself; in such cases I do not think a much, if any, heavier stock could be kept than is now found. But inasmuch as there are still many and frequent exceptions to such management, I have no hesitation in saying that, in too many cases, British farmers could, with profit to themselves, breed more horses, cattle, and sheep than they do.

Farms that are near large towns, when much of the work is on the road and has to be done in shafts, or when the work during the spring and early summer is very severe, are not well suited for horse breeding. Again, when there is a deficiency of grass, and the mare and foal must be kept entirely on cut food—though this latter difficulty may be overcome,—when the farm is extensive and the buildings central, so that much time must be lost in bringing home the mares at midday to suckle, breeding cannot be satisfactory; but even under such adverse circumstances it is possible that it would answer to have two or three mares, and so breed enough to replenish the home force; whereas, under ordinary conditions, there is no branch of a farmer's business that is likely to pay better than careful breeding of a good sort of agricultural and dray-horse. There is one fatal objection to breeding, and that is when the conditions, either natural, artificial, preventible or non-preventible, preclude the regular supply of abundant wholesome suitable food. Thus, undrained grass will not produce food capable of making good bone and muscle; while there are other unfavourable influences, such as the propinquity of chemical works, which at certain times cause a deposit of noxious matter on the grass. The latter is, of course, a very exceptional case. I allude to it from having seen its deleterious effects. Under ordinary conditions, not only can breeding be pursued with profit, but the work of the farm need not be materially interfered with on account of it. I hold a strong opinion that it is practicable and profitable to commence breeding when the filly is two years old. So far from growth being checked, as is sometimes urged, I find that, with good feeding, size is increased. The filly, after being served, should be bitted and lightly worked during the summer. After foaling she must be turned away, with her foal, for a summer's run, and afterwards come regularly into work.

When the soil is unsuitable to breeding cattle, as on land liable to red-water, on weak undrained pastures, or on moory land deficient in the requisite mineral elements, it is advisable to purchase strong stores having superior power to resist adverse conditions; and so buying in such cases is preferable to breeding, as a rule, and of course such a reply must be considered as very general. Well-drained clay land is more suitable for growing young stock, provided we have facilities for dry lair, than light weak soils, and this because the natural food supplies all the necessaries for healthy development. It is true that much of this can be supplied artificially, and thus, by a judicious use of foreign materials, excellent results are obtained; but good natural produce is the most healthy and economical.

The inability to keep a breeding-flock of sheep in a healthy condition makes purchasing store sheep advisable. There are farms which are unsuitable for breeding—strong land, for example. Again, there are farms on which the proportion of winter-food greatly predominates, and where it is difficult, if not impossible, to produce a regular succession of spring and summer food, which is essential to success. Considerable variety of food is necessary for healthy life in a young state; all these are reasons for or against a breeding flock. There are circumstances outside the farm which materially affect the question, viz., the proportion between demand and supply. A few years since sheep could often be bought cheaper than they could be bred—a condition of things that has not been met with recently or is likely soon to recur.

In my experience, which is only limited, I am not aware of any circumstances existing which would render the exclusive breeding of horses profitable. I have always found that inasmuch as a farmer's prospects are influenced by so many circumstances, it is not wise to put all the eggs into one basket, but to distribute them as much as possible. Further, it is well known that horses are the worst grazers. A farmer who is entirely stocked with cattle of this kind would, unless very liberal returns were made, find the quality of his grass deteriorate. In most instances the cattle and sheep should form the predominating stock, and the horses be kept as a hobby—three or four brood-mares. A really good dam often brings in a small fortune to the owner, and when there is the chance of using a good horse, it is quite a profitable business on a small scale; but it is a great nuisance to have a quantity of young horses gnawing the heart out of the pasture, when cattle would grow to more advantage and improve the land.

On real turnip-soils, where little or no permanent grass occurs, and when a heavy expense attends the leading of roots, I hold a strong opinion that sheep are the most profitable stock. On stronger land, and where grass is more abundant, cattle will frequently pay more money than sheep.

In this district of Yorkshire I consider that the Lincolnshire breed of cart-horses answer remarkably well, also the Clydesdale; but I prefer the first named. Yorkshire-bred Shorthorns are universal, the farmers using a pedigree bull. The cross between the Lincoln and Leicester sheep answer well. For the United Kingdom I believe Shorthorn cattle and Shropshire sheep are the most suitable.

JOHN COLEMAN.

8. WEST DRUMS, FORFARSHIRE, N.B.

The question of breeding more stock depends on the prices at which horses, cattle, and sheep can be bought. The present very high rates show pretty clearly that we should breed more than we do, where the circumstances are favourable for such practice; but of late years, in my opinion, the better class of English and Irish cattle, with which I have had chiefly to do, have been bought at rates yielding a better return for keep than would have been obtained from a breeding-stock, with its many hazards. As many horses, as a rule, should be bred (unless in very unfavourable circumstances) as will supply the waste of the farm.

Many farms are but ill adapted for the rearing of horses; first, from the want of sufficient grass area and suitable fences. The harder nature of soils, especially if mixed with pebbles, is often injurious to the feet of the young horse, causing contraction and other faults. Again, these farms are generally of a difficult character to work, and require a thoroughly-matured horse; on such lands the three-year-old horse is unable for his turn, and is often spoiled. These circumstances form the chief inducements to purchase, rather than rear, on such farms.

Land producing a good quality of grass can generally be turned to better account by placing well-bred two-year-old cattle upon it than by using it for breeding-stock purposes. Land producing inferior grass may be either used for breeding-stock purposes, or for the keep of one-year-old cattle; but will require in either case to be supplemented by feeding-stuffs.

A very large acreage of arable land, partly stocked with cattle and partly with sheep, is implied before the breeding and feeding of sheep can be done to advantage; but on more limited areas sheep are often purchased in spring in advanced condition rather than lean, and kept for a few months as a flying stock; and this is often done to advantage on enclosed lands.

There must be great adaptability of soil, fencing, &c., for the rearing of agricultural horses, hacks, hunters, &c., before it can be more profitable than the breeding and feeding of cattle and sheep.

There are undoubtedly some lands, even whole counties, that would seem, from the prevailing practice, to be better adapted for sheep than cattle; but, in my experience, more rent can be made out of land of fair quality from grazing and feeding cattle than sheep. Ireland is not suitable, from its climate, to sheep-husbandry, but it is remarkably adapted to the production of cattle.

A friend of mine, who farmed extensively in a neighbouring county and was an excellent manager of cattle-stock, but reared very few, leased a farm in the south of Scotland some years ago, and continued his practice of cattle-management, which had been quite successful here; but experience has led him to draw more into sheep-stock. The only reason he gives for it is, that cattle do not graze so satisfactorily with them as with us, and that for grazing purposes he prefers sheep. I have also known an extensive farmer in Forfarshire who abandoned sheep and took to cattle, on the plea that both stocks could not be managed to advantage. His acreage was about 800.

For agricultural purposes the medium-sized Clydesdale horse is best suited. Of cattle, well-bred Shorthorns or polled Angus, or good crosses with these breeds, are our most profitable sorts. Of sheep, the Border Leicester, or half-bred, for grazing and feeding purposes on arable lands, rank first. In some parts the Shropshire Downs have been introduced with success.

WILLIAM SMITH.

9. RIBSTON HALL, WETHERBY, YORKSHIRE.

In this neighbourhood there is no doubt that many, indeed, the majority, of the farmers have given up breeding cattle, and now buy in Irish stock, which they fatten. The usual practice is to buy lean cattle in October, winter them and sell fat from the pastures during the following summer. Bullocks are generally preferred, because geld cows and heifers very frequently turn out to be in-calf. Of late years the quality of these bullocks has wonderfully improved, many of them being full of Shorthorn blood, and all of them crosses. They are hardy, and quick feeders, and suit the climate and quality of our grass land, which is scarcely good enough to feed off big Shorthorn bullocks without the assistance of cake. In many cases the bullocks get nothing but straw and turnips during the winter, it being a common practice to pull about a third of the swede crop for them; but of late years, since the introduction of cotton-cake, they are often treated to a portion of cake in winter, and it is becoming more usual to see also the cake-troughs in the pastures, much to the advantage of the stock and the land. The farmer who has capital considers that he turns over his money quicker, and insures a speedier return by this system, than by keeping on his farm a breeding-stock; and I fear that some who are short of capital are accommodated by the dealers, who make a profit at both ends with the cattle, and, as I am informed, not unfrequently have a lien upon the stock while it is being fed by the farmer.

At one time this class of stock suffered seriously from pleuro-pneumonia, and I can remember two lots of cattle in different years nearly all falling victims. At present the stock is generally healthy, except from the epidemic of foot-and-mouth disease, which seems to give little anxiety to the grazier, unless it attacks the beasts which are nearly ready for the butcher, about August or September, when, as in the present year, they may be thrown back for finishing in winter.

When I look at the price of butter in the present day, and compare it with the same article twenty years ago, I am rather surprised that more attention is not paid to this branch of agriculture. In 1852, I was farming, and my butter ranged from 8*d.* to 1*s.* 3*d.* per lb. of 16 ozs. In 1865, when I gave up my farm, the price ranged from 1*s.* to 1*s.* 8*d.*, and in May and June of last year the price has not been lower than 1*s.*, and is now 1*s.* 10*d.* per lb. The difficulty in breeding stock here is very much a question of labour. Farms are larger than they were, and farmers' wives and daughters do not take the same personal interest in rearing stock which their predecessors did twenty-five or thirty years ago. It is now most difficult to get women to milk, and, indeed, it is not an easy task to get either good shepherds or cowmen; and this fact alone has had much to do with the preference for buying in stock instead of rearing it upon the farm. Perhaps, also, the increased severity of foot-and-mouth disease as affecting pregnant or milking-cows may have had its influence in leading farmers to prefer feeding bullocks.

A considerable number of sheep are bred and fed off. It is a common custom to buy North-country ewes from the border, to take one crop of lambs, and have the hoggets fat after clipping time. Some very good farmers buy older sheep either about May or June for their clovers, or about September for turnips. They are rather better able to stand bad weather on some of the stronger land; and they get fat, and are cleared off somewhat earlier in the spring than lambs, enabling the farmer to get a better tilth on his strong land, and so insure a crop of barley; as a portion of our land, although growing good crops of turnips, is apt to be sticky and dirty when trampled by sheep in bad weather.

The price of such lean sheep has nearly doubled in the last twenty-five years. North-country lambs were bought at St. Boswell's Fair from 20*s.* to 25*s.* each at that time, and lambs of similar quality this year are worth 2*l.* each. Shearling wethers have risen in the same proportion.

The very few horses which are bred in this neighbourhood are generally for agricultural purposes, and at the present price of beef and mutton few of our farmers would be tempted to run the risk of breeding carriage-horses and hunters.

My own opinion would have been that our farmers might do better by breeding more stock, and then feeding them high and getting them off as two-year-olds; but most of our best practical men adopt the system which I have endeavoured to sketch. One of my neighbours has just finished buying his autumn lot of Irish bullocks, which have averaged rather over 12*l.* each for nearly 70; another has bought about 90 at something like 9*l.* each. The bigger ones will get straw at night in the fold, turnips on the grass in the day-time, and in the spring some cake, and probably some more cake in early summer on the grass. A large number of the smaller-sized lot will very likely have nothing but grass, unless the winter be severe, and then they will have straw brought to them in their pasture.

JOHN DENT DENT.

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10. KERCHESTERS, KELSO.

Considering the high price of horses, cattle, and sheep, the British farmers could largely increase the breeding of all the above classes of stock. The increase might be at a much greater ratio if the tenant-farmer had more security for his capital than under present circumstances.

On arable farms, where the land is high-rented, other kinds of stock give more return than horses. It is very difficult to get mares to breed, on account of the high feeding they receive and the fast pace at which they are driven in the border district. Small farmers, with grass land at a moderate rent, along with their personal care and superintendence, can rear horses with considerable profit. The more extensive farmers will be obliged to pay more attention to the breeding of horses, when they are commanding such an extreme price as nearly 100*l.* apiece for working animals.

Cattle can be bred and reared on the old grass lands of Yorkshire, Cumberland, and Westmoreland, cheaper than we can raise them on our arable or even grass land. The coarser grasses seem to suit them better, and the change to our richer feed seems to act to great advantage. My experience is that cattle grazed upon rough hill-pasture do much better than those in parks, which are rented at 5*l.* or 6*l.* per acre. The latter land does not yield an equal feed for them all the season, while upon the former they have more room and a greater diversity of natural grasses.

Many farms can both breed and feed sheep ready for the butcher, and where that course is practicable, the farmer reaps the profit of both breeder and feeder. But on the majority of farms this system cannot be followed out. On good land it is more profitable to buy-in feeding sheep than to keep ewes and lambs. Ewes are apt to get too fat on rich land, and are very subject to diseases of one kind and another, while lambs require a great deal of room for them to thrive well, especially after being weaned. Young stock require clean fresh meat to keep them healthy. This cannot be supplied on high-rented land. Artificial food is of little use in this case. Feeding-sheep can be put thicker on the land, and feeding-stuffs can be used with freedom along with turnips and grass.

As to hacks and hunters, I do not know of any circumstances in which they can be bred with more profit to the farmer than the breeding and feeding of cattle or sheep.

In my experience, sheep are more profitable than cattle. They enrich the land more equally, and are kept at less expense. They are also growing two sources of profit, mutton and wool, while cattle are only growing beef. Their hides do not increase much in value. Cattle must be kept to a certain extent to work out the profits of the farm, in making manure, &c., for the turnip crop. In such a country as Ireland, where the climate is wet and humid, cattle will pay better, as sheep thrive best in a dry atmosphere.

The Clydesdale horse is best. The nearer the pure Shorthorn the better for cattle. In regard to our sheep stock on the borders, the Border Leicester has taken a prominent part on our arable land, and no other class of stock has been able to compete with it. However, for the present taste of our consuming classes they have rather too much fat upon them, although most of them are marketed before they are twelve months old. Their true value to our country is the result produced by crossing the Cheviot ewe with them. The half-bred sheep is now the most popular. They grow the finest class of wool in the market, while butchers are particularly fond of their meat. The lean and fat are well mixed, and their carcases command a high price in the London and provincial markets. For our soil and climate we can imagine no more profitable sheep than the latter. You have good wool, a sound constitution, fast feeding-powers, moderate size, and the best quality of mutton. The Border Leicester has also been successfully crossed with Black-faced and Grey-faced ewes. This cross has produced even a finer class of sheep as regards mutton, but the wool is not of such fine quality, nor do they grow to the same size. In the Cheviot Hills, a class of stock of that name occupy the higher lands; the lower range of hills being grazed with half-bred sheep most part of the year. Amidst the Lammermoors, on the ground where half-breds cannot be kept, the Black-faced and Halflangs find a home. The latter class are also a hybrid breed—a cross betwixt the Cheviot tup and the pure Black-faced ewe. They can exist on the same pasturage as the latter, grow a better class of wool, and are more easily disposed of as draft ewes, but their produce is difficult to fatten when young.

John Clay.

11. BORDLANDS, NOBLEHOUSE, N.B.

In the Lothians corn-growing is likely to continue the principal object with the farmer. If corn-growing won't pay there, it won't pay in Scotland at all. I used to graze two-thirds of my grass at Fenton Barns a second year, but this was for more easily obtaining potato crops or larger grain crops. I used to find it pay me very well to rear a score of calves there. I know one farmer who used to rear every year from 25 to 35 calves who has given it over; but I think this has been owing to the purchase of some inferior-bred ones, and the bringing up of more calves than there was milk for. Unless a calf is by a thoroughbred bull it will not pay to rear it in the Lothians. On the whole, the Lothians are better adapted for *feeding* stock than *rearing* them. The greater part of the kingdom grows more grass per acre; though, from the smaller rainfall in the Lothians, the animals there put on more flesh in a shorter time. I believe, at present prices, it will pay to rear work-horses anywhere. I used to breed 2 or 3 every year to keep up my own stocking, as I considered them more healthy than those purchased. I had at one time a 100-acre park of inferior land in grass, enclosed with a good stone wall, where I reared horses with pleasure, as they ran there the whole season; but at Fenton Barns I found it difficult to prevent yearling or two-year-old colts from breaking the fences and trampling the corn. I believe that if there was a well-fenced field laid off in permanent pasture on every farm, it would greatly encourage the breeding of horses, and otherwise pay the farmer.

GEORGE HOPE.

12. ELVASTON ESTATE OFFICE, DERBY.

Not only on isolated farms, but throughout wide districts, an increased number of stock could be profitably raised, the particular kinds of which would depend, to a great extent, on the nature of the soil and the climate, and whether grass or tillage predominate, or the occupations are of a mixed character.

On all large arable farms under a regular rotation of crops, and where the area of permanent pasture is limited in extent—even at present prices, when good draught-horses are at a premium of 150 per cent. on the average prices of recent years—it is more economical to purchase than to breed the necessary supply. On farms of this character the whole of the available horse-power is called into requisition during the months of March and April in preparing the land and completing the spring seeding. The two following months demand equal exertions in preparing for the root-crops. In-foal mares suffer no injury, but are rather benefited by being worked up to the day of foaling, provided they are always kept at plough or in chains, carefully handled, and not over-driven. The negligence of a careless servant, or the act of a driving master, anxious to take advantage of a favourable season, often endangers both the mother and the progeny. I have frequently known mares to cast their foals from over-work. Assuming that parturition has been safely accomplished, in about a week or ten days afterwards the mare is again put regularly to work. During working-hours the foal is shut up in the farmyard. In many localities the practice still lingers of taking only one yoking a day; in this case the young growing animal has to endure a fast of seven or eight hours' duration. The mother returns often in a profuse state of perspiration—the effects of fretting, caused by separation from her foal, and the suffering entailed by the retention of the milk for a lengthened period. Picture the effect of such a system on the health of the mother and the growth and development of the progeny. Steam is rapidly superseding horse-power, and displacing a number of horses on most farms, yet the labour of the residue has not decreased. On dairy-farms, and others with a fair proportion of secondary grass land, the breeding of a good class of draught-horses is now one of the most profitable branches of the farmers' occupation. Good foals will now readily make 40*l.* each. With us the great bar to improvement is the want of good stallions.

Cattle-breeding would not pay on the fine feeding-pastures of the midland counties. It is well known to practical graziers, that using their best feeding-grounds for the growth of young stock would deteriorate from their value, and in the course of a few years reduce them to ordinary store-pastures. A self-supporting farm, that is, one adapted both to breeding and feeding, is now the most profitable, as it brings the profits of both breeder and feeder into the hands of the same individual. Another point of great importance is immunity of risk from imported diseases. A farm specially adapted for breeding and feeding requires a combination of circumstances rarely to be met with. It is essential that there should be a fair proportion of tillage-land for the growth of straw and roots; a good breadth of store-pastures, and some fine grazing-land. I think every dairy-farm should breed and rear a sufficient number to keep up its stock. The high price of beef is inducing farmers to use a greater quantity of artificial food. Improved breed, and high feeding from birth, insure early maturity. On many farms with no feeding-land a large weight of beef is being produced, and very few lean old bullocks are seen in the fairs and markets.

On large tillage-farms, where the soil and climate are suitable to the growth of roots, except under exceptional circumstances, a sufficient number of sheep cannot profitably be bred on the farm to consume the root-crops. There must either be a considerable area of permanent pasture attached to the farm, or a succession of forage crops provided, as is generally practised in the southern counties of England.

The breeding of hacks and hunters is of too speculative a character to be indulged in to any extent by ordinary farmers. It requires a man of great judgment and experience to succeed.

Taking the ordinary stock of the farm for the purpose of breeding and feeding, I think, just now, sheep are to be preferred to cattle. Dairying, however, is more profitable than either; though much is dependent on local circumstances.

In my locality the breeding of hacks and hunters is declining, whilst that of heavy-draught horses is on the increase; but not to such an extent as to materially interfere with the breeding of cattle and sheep. Many colts are grazed on the rich alluvial valleys of Derbyshire. There are no farmers in the district who devote their attention exclusively to the breeding and rearing of horses.

Owing to the difficulties of the labour question, particularly that of obtaining milkers, I know several farmers, both in Derbyshire and Cheshire, who are driven from dairying to breeding and feeding cattle and sheep; though both soil and climate are better adapted for dairying than any other system.

The kind of draught-horses most popular in these parts is the lethargic, hairy-legged descendant of the old English cart-horse, with his upright shoulder, whose snail-like pace ill accords with the requirements of the age. I prefer the improved Clydesdale, as being the *beau idéal* of a cart-horse. A few good stallions of that breed introduced into this county would in a few years greatly add to the value of the heavy horses of this district.

The Yorkshire Shorthorn, or home-bred, is the prevailing breed of cattle here. They are being rapidly improved by a cross with the pedigree Shorthorn. For the double purpose of producing milk and meat they cannot be excelled, and are well adapted to surrounding circumstances.

Sheep and dairy-cows do not succeed well on the same pasture; hence the number of sheep bred and fed in the county is small. The Shropshire is now the leading breed. They produce a fair quantity of wool, and the carcase is much esteemed by the butcher. They are hardy and prolific, and attain good weights at an early age.

GILBERT MURRAY.

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13. KILLERBY, CATTERICK.

As a rule, I think most profit is made in regular farming by breeding the stock, *i.e.*, cattle, sheep and horses requisite to consume the produce which the farm grows; and I think it would be a benefit to farmers in general to breed more stock.

Horses cannot very well be bred on arable farms, or on farms where the land is of very good quality and will fatten cattle and sheep, as the latter, under such circumstances, pay better. The farms best adapted for breeding horses are those on which there is a large portion of low-lying grass land of poor quality, which is not good enough for feeding cattle, and which is too marshy for sheep. On this kind of land horses do remarkably well in summer—when other stock will not thrive—and will pay well, provided the dams and sires are well and judiciously selected. The great difficulty in the present day is to obtain a good sire to put mares to. It is the breeding from unsound sires which has caused many farmers to be disappointed in breeding horses, and so give it up.

A law should be made prohibiting any horse affected with hereditary diseases (such as roaring, &c.) from serving mares; and I would require each stallion to be examined by a veterinary surgeon appointed by Government, and to be certified by him as sound, before he should be allowed to serve a mare.

The farms on which cattle-breeding is more profitable than purchasing, are those which have grass land not sufficiently good for fattening cattle. There are many farms of this class of land in this district, where, fifteen or twenty years ago, the tenants bred and reared the whole of the cattle which they kept on their farms. The cattle were generally grazed until they were three years old, and then fed on turnips, and sold fat; and it was no uncommon thing to see bullocks weighing 70 to 80 stones each (14 lbs. to the stone) going to market off these farms; but of late years the custom has very much changed. This change has, in my opinion, been very much brought about by the severe losses which many farmers have suffered from the ravages of foot-and-mouth disease among their breeding-cows. There is not more than one calf bred now where there were ten at that time. A great proportion of the land is now grazed by third-rate Irish cattle, which, in my opinion, do not pay the farmer nearly so well as he would get paid by keeping a good lot of dairy-cows, making butter, and breeding and rearing his own stock for his farm; to say nothing of the losses which occur from the importation of diseases—such as pleuro and foot-and-mouth disease—on to the farm through purchasing.

On arable farms sufficient cattle cannot be bred (profitably) to consume the straw and roots; and when the grass land is of rich feeding quality, it is more profitable to buy in cattle of mature age for grazing purposes, than to rear young animals.

There are some farms of light land (turnip and barley soils) which pay better in tillage than in grass, and which require the turnips to be consumed on the land by sheep; so a larger number of sheep are required during the winter months for this purpose than the farm can carry during the summer; and it is, under these circumstances, more profitable to buy sheep than to breed them.

I do not think that any rule can be laid down as to whether sheep or cattle are the most profitable to the British and Irish farmer, as everything depends on the nature of the soil. Sheep will pay best on light dry soils, and cattle best on rich and stronger land; it is seldom that a good cattle-farm is a good sheep-farm, and *vice versâ.*

I have myself almost given up breeding horses in favour of cattle-breeding, and with profitable results; the cause being the difficulty in getting good and sound sires, and so many of the produce being unsound (roarers, &c.). I used to breed a number of horses, as well as cattle.

At the time the cattle-plague was in England, many farmers increased their flocks of breeding-ewes; and I think there are more sheep now bred in this part of the country than there were before that time.

The agricultural horses best adapted to this district are the Clydesdale, they being more active, and not quite so heavy as the Lincolnshire horses.

The cattle best adapted to this part of the country, and also for the United Kingdom, as well as every other part of the globe, are Shorthorns.

The sheep which do best are a strong class of Leicester, almost approaching the "refined" Lincoln.

John B. Booth.

14. Bolshan, Forfarshire, N.B.

At present high prices, there can be no doubt, if we farmers could breed good horses it would pay us well to do so, where the nature of our farms afforded facilities for it; but unfortunately those of us whose farms consist wholly of arable land, and who cultivate land highly, have to work our horses hard, and with the high feeding we must give them, the breeding results are seldom satisfactory. Again, we have no great choice of good stallions, and such as travel to serve mares get too much to do. Then, most farmers who are in the habit of breeding and rearing young horses, are not very particular as to the kind of mares they breed from, and the consequence is an inferior progeny. To carry out the system to make it pay, as we do with cattle, we should require a breeding-stud of mares to do little else, and a first-class entire horse, besides some rough grass land, as well as permanent pasture. But a stock of the right stamp would require a purse which few farmers have at their command; and to change from rearing and feeding cattle and sheep to breeding horses would involve a risk that most of us would not care to encounter. I used to breed a few horses here, but my land being all arable and in regular rotation, I did not find it a profitable business for the reason stated. I just had two or three of the working-mares covered with travelling stallions, as most farmers who breed in this part of the country have, and the produce was so often disappointing, that I ceased some years ago to continue it, believing that it was better to buy what I required than to breed for the farm. That was, however, when prices were much lower: lately I have resumed covering two or three mares as formerly; but to do so successfully, as I have said, an entire horse, with a stud of breeding-mares, would have to be kept, and I think I am safer with cattle and sheep; for if farmers were changing to horse-breeding extensively, prices would fall below the paying point.

Wm. Goodlet.

15. Dochfour, Inverness, N.B.

I think that British farmers could breed more stock than they now do with profit to themselves. Horses, cattle, and sheep sell at very high prices, with an increasing demand, while prices of grain are correspondingly low. The cost of labour is high where rapid rotation of cropping is in practice, and such a system is also very exhaustive of the soil. I should, therefore, strongly recommend an increased cultivation of roots, as well as of grass and hay, and at least one grain-crop fewer in the rotation. I would also advise more stall- or box-feeding of cattle in summer as well as in winter, supplying corn and cake as auxiliary food. This would insure a much larger quantity of better manure than is usually obtained, which, if returned to the land without waste, would produce larger crops than now, at much less expense. The question of litter is an important one, but there are many ways of getting over this difficulty, such as by special construction of stalls, and the use of various absorbents as bedding. In any case, the manure thus made in summer would be tenfold more valuable than if dropped by the animals while grazing in the field; and the increased weight of crops that must follow would again enable the farmer to keep an increased number of stock, and in this way large and increasing returns from the farm would be obtained, until a very satisfactory maximum would be arrived at.

On many farms neither buildings nor fences are suitable for rearing horses. Stone dykes or thorn-hedges only are suitable as fences where a number of young colts are grazed together; and during winter they must have suitable yards or boxes. Strong cold-bottomed soils, with plenty of shelter and good water, are, I should say, essential for the rearing of useful and sound-constitutioned horses of whatever breed. And if these requirements, together with suitable housing in winter, are not within reach of the breeder, he had better leave breeding alone, and purchase from those who have the advantages spoken of.

Farmers occupying strong clay-soils, and following the four-course shift, must of necessity purchase wintering or store-cattle, as, after providing for a haystack, the working-stock of the farm and a few milk-cows will consume the balance of the grass crop. The six-course rotation, with three white crops, also necessitates the buying of store-cattle, as the farm will at least winter twice the number it will summer, according to the now common practice of feeding stock. There are few farms that are not adapted for either outdoor or indoor feeding of stock. And whenever stock can be fed, present circumstances strongly recommend that they should also be bred, and the rotation of cropping made as suitable as possible for so doing.

There are hundreds of thousands of sheep bred annually on holdings that do not embrace a single acre suited for fattening, and must therefore be sold to those whose lands and crops are suited for feeding, but who could not themselves breed the same class of sheep at double the cost.

The present state of markets, coupled with the present high cost of labour, no doubt encourages the breeding of horses of almost all breeds, because such could be done on farms largely under grass, and worked at greatly less expense than where breeding and feeding of cattle and sheep are practised; as in the latter case root-crops must be cultivated largely, thus necessitating regular rotation, and heavy outlays for labour and manures.

No one would consider it safe for farmers generally to go largely into breeding of horses. The demand must remain a limited one, and any very great increase in the number bred would necessarily cause a ruinous reduction of price, and an immediate return to the safer and more universal practice of breeding cattle and sheep. Horses bred and reared on a farm will do better on that farm than those that have been purchased or reared elsewhere. According to this, every farmer ought—if at all convenient—to breed and rear horses for his own requirements. But I would say that I know of no circumstances that would warrant farmers generally in adopting the breeding of agricultural horses, hacks, or hunters, as likely to prove more profitable than the breeding and feeding of cattle and sheep.

On arable farms, in regular rotation as practised in Scotland, sheep exclusively are not suitable stock, nor will they be found at all equal to well-bred cattle as a source of profit. On a purely grazing farm, sheep will certainly pay better than any description of cattle will. And on farms where a moderate extent of pasture land is held in connection with arable land, sheep will also pay well, and here a farmer may also breed and fatten his own sheep. But he must not debit his cattle-stock with all the extra cost of maintenance and care, compared with that of the sheep-stock; because with a sheep-stock alone the fertility of his farm could not be maintained without much more heavy outlays in manures than would be required with a well-managed cattle-stock.

I consider a moderately-sized Clydesdale horse by far the most suitable for general farm purposes of any horse known in the north of Scotland, whether estimated by his docility and durability, or by his action, style, and appearance, or even by his cost of maintenance.

In cattle, I would say that for early maturity, symmetry, fat, and weight, nothing will, in my opinion, come up to the cross by a Shorthorn bull and a Blackpolled cow; and if these characteristics are to be looked for in any pure breed, I would say they will be most readily found in the Shorthorn.

JAMES MOLLISON.

16. WESTON PARK, SHIPSTON-ON-STOUR.

Well-managed farms, whether devoted to breeding or feeding, in England or Scotland, very generally carry considerably more live stock than the average of their district, and demonstrate what extra capital and enterprise can still accomplish in this important matter. In most localities the animals of the farm, and especially the cattle, sheep, and pigs, might profitably be bred and kept in larger proportion to the acre by selecting varieties coming to earlier maturity, and making the best use of the food supplied to them by keeping the lambs, calves, and yearlings more liberally; by using more concentrated and purchased foods; and by economising fodder and roots, by chaff-cutting and pulping.

Local circumstances, the taste of the breeders, and the natural disposition to do what is done successfully by their neighbours, have made certain localities the strongholds of particular breeds of horses: Renfrew, Dumbarton, and Lanark produce the biggest and most powerful Clydesdales; Cambridge and Lincolnshire have long been equally famous for their ponderous dray-teams; Norfolk and Suffolk stand pre-eminent for trotting-horses; the Yorkshire Ridings still produce many of the most handsome and stylish carriage-horses.

Throughout the midland counties of England not many horses of the lighter descriptions are bred. For many years the good returns from cattle and sheep have seriously discouraged this department of horse-breeding. The midland counties have no special breed of cart-horses; the best of them may be described as intermediate between the active, clean-legged, stout, serviceable Welsh and Herefordshire horse, and the heavier, hairy-limbed, slower dray-horse of Leicester or Cambridgeshire. Good brood-mares are scarce. Stallions, although sufficiently numerous, generally lack size, quality, and action, and receive inadequate encouragement from the usual service fee of 20s. per mare. The Duke of Marlborough at Blenheim, Sir G. R. Philips at Weston Park, Warwickshire, adopting the plan pursued at Her Majesty's Shaw Farm at Windsor, have brought south a succession of good Clydesdale horses, which have mixed well with the slow, heavy, rather rough mares of the country, and considerably improved the action, style, and constitution of the breed.

Small farmers, especially in Scotland, are usually the most successful cart-horse breeders. They devote to the pursuit special individual attention, frequently work themselves or overlook the working of the in-foal mare, and carefully feed and handle the young one. Without a large paddock or field of permanent pasture in which the colts can take exercise, even in bad weather and throughout the winter, the difficulties and risks of rearing young horses are greatly increased. Heavy land is unsuitable for horse-breeding; it becomes readily poached, and tries too severely the strength, pace, and smartness of the youngsters when first put to the collar. Farms abounding in steep hills, devoid of good roads, where there are heavy extra demands on the horse-power for haulage of town manure, building materials, or draining-pipes, are unsuitable, if not for the breeding, at least for the breaking-in of horses, and such farms are most profitably worked by purchased seasoned horses.

The breeding of horses is most successfully carried out on the lighter and drier soils, where the rent is moderate, where a considerable area is in permanent pasture, where the water supply is regular and abundant, where the enclosures are small so as to avoid more than three or four young horses being turned out together, and where fences and gates can be maintained in a strong and perfect state. On some rough woodland-pastures, especially at certain seasons, irritant plants are produced, or shoots of trees which scour cattle and sheep are eaten; whilst among the old permanent pasture are sometimes developed bronchial filaria, black-leg, or abortion in pregnant cows. Such grazings are often safely and profitably appropriated to horses.

Without special taste on the part of the farmer, and special aptitude for breeding and making young horses, the breeding of hunters, hacks, or even of harness-horses, is seldom a paying pursuit. On arable farms, the successful breeding of such colts is almost impossible. On grass farms it cannot be satisfactorily carried on without small enclosures, as of 6 or 8 acres, with field-hovels in which the young animals can in winter weather be sheltered and fed. Horses of the better-bred sorts are most profitably reared on low-rented farms, remote from towns, possessed of light dry soils, well watered, and where undulating surfaces determine sure-footedness and courage, with development of compact bone and firm muscle. But such well-bred colts, if thriving and liberally kept, are very constantly in mischief, breaking gates and fences, barking trees, galloping young cattle and sheep, and running serious risk of injuring themselves or their neighbours. The best cannot be made of them until they are over four years old, and for fully a year before this they must be in the stable, handled and made more or less perfect in their duties. I am cognisant of two farms in Warwickshire, which for some years were specially devoted to the breeding of the best class of hunters and carriage-horses, were skilfully managed, but have both proved failures. I have known scores of young farmers in the midland counties of England enter with intelligence and zeal into the breeding of nags; grudge no reasonable expense in gaining access to first-class sires; persevere for some years; get a few good colts and a proportion of misfits; encounter the sad discouragement of valuable mares slipping foal or persistently proving barren; sorrow over promising colts reduced to half their value by accident and unsoundness; discover, alas too often! just when the grand horse was fit to go, that he "made a little noise." With such unsatisfactory experiences the systematic breeding of nags is relinquished, and from the Irish or Welsh droves the young farmer finds it more profitable to purchase three- or four-year-olds, even though they now cost from 40*l.* to 60*l.*

Good cart-horses find ready customers at any age; are less destructive and more quiet when grazed amongst other stock. The high figures given for good cart-horses of all ages, and the especially remunerative sale of ordinary foals at thirty to forty guineas, have already had their natural effect in stimulating production. But years must elapse before the supply of good horses again becomes equal to the demand.

Shorthorns and Shorthorn crosses are now the chief cattle bred or purchased throughout the midland counties, and presumedly are found the most profitable. They have steadily superseded the Herefords and Longhorns, which half-a-century ago were the cattle almost exclusively kept. On a few upland farms along the Malvern and Breedon Hills, and on the Cotswolds, some Herefords are still bred, are reputed fair milkers, but never bring so much money as Shorthorns of the same age; teams of four to six of the oxen, yoked in a line, may in these districts still be seen ploughing, carting, and doing other farm work. On four farms in the neighbourhood of Stratford-on-Avon, polled Angus bulls from the best Aberdeenshire herds have for some years been used on ordinary non-pedigreed Shorthorn cows. The first cross follow the sire rather than the dam; are hardier than Shorthorns; are thick, short-legged, symmetrical beasts, much prized by the butcher: although bred from red, white, and roan Shorthorn cows, they are blacks and dark greys in almost equal proportions, and almost invariably are without even rudimentary horns. These half-breds, put either to a polled Angus or Shorthorn sire, furnish useful animals; but as the first cross—the progeny of the pure-breds—are more shapely and uniform, they are being regularly fed out, fresh Shorthorn dams being obtained as required.

The sheep are more diversified than the cattle. On many of the poorer and thinner soils, where the flock is necessarily run thin, the big long-woolled Cotswolds and Oxfordshire Downs are bred. From Oxford and other neighbouring markets a hardy admirable class of Oxford Downs or half-breds can usually be procured, at about 12 months making readily 20 lbs. a quarter, and clipping 8 or 9 lbs. of wool. In the more northerly and westerly portions of the midland counties are many breeders of pure Leicesters and Shropshires; whilst many farmers indulge in various cross-bred sorts, putting Shropshire, Wiltshire, or Hampshire Down tups upon the longer woolled ewes, and preferring the Down infusion on account of its securing hardiness, lean meat, and adaptability for living alike during summer and winter in pens.

The more extended cultivation of roots, the increased use of concentrated food, and the earlier age at which both cattle and sheep are ready for the butcher, now induce many breeders to feed out most of their cattle and sheep. The home-bred are usually found more profitable than the purchased stocks. There is more chance of their having been carefully and progressively managed; they are acclimatised, and are exempt from the risk of importing contagious disease—a most serious drawback to the buying-in of stock. In recent years the breeder has had the best share of the profit.

To buy rather than to breed the live-stock of the farm is desirable where the land is heavy and retentive, rich and well-adapted for feeding-purposes, producing irritant herbage, which scours or otherwise injures young animals, or causes cows or ewes to abort. Land near large towns is usually more profitably devoted to feeding or dairying than to breeding stock. Salt marshes, pastures frequently flooded, and those where the water supply is precarious, are especially unsuitable for young animals.

In most parts of the country a system of mixed husbandry is found to answer best; whilst still further to increase his chances of remuneration and diminish his risks, the farmer generally goes in for different sorts of live stock. To use a Hibernianism, I would say, "all sorts are best," but on most farms sheep properly managed generally yield the handsomest returns. On holdings mainly arable, and where heavy land preponderates, cattle in larger proportion are required to utilise the abundance of straw. On some of the rich permanent pastures which abound in various English counties, where the herbage is luxuriant, and on many soft flooded and alluvial grazings, cattle do better than sheep, which, under such circumstances, especially in wet seasons, often suffer from foot-rot. Conversely, sheep are preferable to cattle where farms have insufficient yard or shed accommodation, as is too often the case; also where the fences are weak, insufficient, or absent; and where the land is light and poor, and benefited alike by the droppings and the treading of the sheep. Where water is not regularly obtainable, sheep, especially adult and dry sheep, do rather better than cattle, although in dry hot weather all sheep require a daily supply of water.

I know of no instance in which cattle have been abandoned to make way for either sheep or horses, or *vice versâ;* but numerous instances occur in which sheep are more largely introduced on the arable holdings formerly more exclusively devoted to cattle; on the lighter uplands the flock masters manage to breed and feed more beasts than they did twenty years ago; whilst on almost every description of farm the high price of horses has within the last year or two encouraged the breeding of a few cart-colts.

FINLAY DUN.

17. SUNDRIDGE HALL, BROMLEY, KENT.

Considering the high price of all kinds of stock for some years past, I think, under favourable circumstances, breeding horses and cattle could be profitably followed in comparison to purchasing. This more particularly applies to horses, at least to a limited degree, where there are meadows or marshes, such as are commonly found in the midland and southern parts of England, and where the mildness of the climate permits young animals to be kept at pasture eight or nine months in the year. In a colder climate, where pastures of one or two years old only can be had, and which in wet weather is injured by the treading of the sharp hoof uprooting the grass, the advantages, and as a consequence the profits, are considerably lessened. In England, where young horses are taken in to graze on meadows, the charge is generally 5*s.* a week. When housed in winter, the cost would be a half more. Horses are put to the yoke at three years old, but they should never be steadily worked for another year. The keep of a horse from the time it is taken from the mare up to three years old would be about 45*l.*, to which must be added 10*l.* for loss of the mare's work during suckling time, risk of rearing successfully, and incidents. The value of a well-bred cart-horse should at present be not less, at three years old, than 70*l.*, or even more, where a good selection of sire and dam has been made.

As regards cattle-breeding, much depends on the quality of the breed, and the facility of obtaining good calves to purchase. One cow should bring up three calves. A cow, to be tolerably well kept on grass in summer, and on turnips in winter, would cost from 10*l.* to 15*l.* That would amount to nearly the value of the calves; but the cow could be milked after weaning the three calves, or she might wean a fourth calf. A cross-bred heifer or steer at one year old should be worth 10*l.* at least. If pure-bred animals are reared the profit must be more. For example, a two-year-old Angus heifer suitable for breeding should be worth from 30*l.* to 40*l.*, and a Shorthorn any price, according to quality and fancy.

Sheep are bred under such varied circumstances, arising from situation, climate, and locality, that no certain conclusion can be come to, except that, considering the present high prices, where it is advisable to keep sheep at all, breeding must pay well. On meadow-grass, after one mowing for hay, 10s. to 20*s.* per acre can be readily got up to Lady-Day.

A farmer can buy such store-cattle for feeding or wintering as may suit his purpose. If he has abundance of fodder, and a short supply of turnips, he can buy according to his keep. If for feeding, he should have cattle in forward condition; if for wintering, he can buy a lot with equally good frames, but in indifferent condition for the coming grass, at a much less figure. Rearing requires more personal attention; and while the profit may be more uniform, a good judge of cattle can avail himself of opportunities to purchase advantageously, which a breeder cannot.

Feeding sheep can best be done with turnips on the ground, which must not be heavy loam or clays, or on grass with an addition of cake. Breeding can be followed under any condition of soil, if dry, but turnips on heavy soil must be pulled and carried to the pasture.

On all ordinary farms there must be necessarily a limit to the breeding of horses. Idle mares for breeding would not compensate if purely agricultural; and the breeding of hacks and hunters is at best so speculative that few farmers would care to try it on an extensive scale. Cattle or sheep must therefore be his *sheet-anchor.*

In Kent, and some other southern counties of England, breeding of agricultural horses has attracted comparatively little attention. Proprietors of land take no heed of the matter by instituting or encouraging Horse Shows, and farmers seem to be as little interested. Hence, all sorts of horses are bred from the Clydesdale and Suffolk Punch, crossed and recrossed, down to nondescripts. It is impossible, therefore, to say what breed preponderates. For many miles round London there is plenty of demand for all sorts of horses, from the tiny pony to the dray, so that the object of the breeder seems to be attained if he can get a foal anyhow out of any mare; and if it does not suit him, it will some one else.

JAMES COWIE.

18. MILLFIELD WOOLER, NORTHUMBERLAND.

Probably British and Irish farmers could not breed more stock unless they kept and fed off fewer. On high-rented land it generally pays better to buy young stock and feed off; but in many instances, where moderate or inferior land forms part of a farm, I think farmers would do well to breed more sheep and cattle. Thus they would secure the profit of both breeder and feeder; whereas, when they buy at high prices, they do not make much by feeding.

Buying store cattle is preferable when the land is too high-priced to enable the farmer to breed so cheaply as he can buy.

Few farms in the north consist entirely of such high-priced land as to render breeding sheep undesirable, and I have found keeping a large ewe flock and breeding and feeding the most profitable. Some farms are unhealthy for young sheep, in which case the farmer had better buy wethers and feed off.

Cattle are fed off at two years old, with ordinary farm care. Sheep are sold at from 10 to 18 months old, fat for market. Cattle are most suitable on deep rich lands, which are less kindly for sheep than lighter soils, and on which sheep are apt to get foot-root, and, if damp, may rot. Sheep do best on higher lands, and on lighter and even gravelly soils, which are too light for cattle.

Breeding agricultural horses should be done at home as much as possible to supply the farm, and the colts kept two in a field to top grass; but it is difficult to get working mares to breed and rear foals, and few farmers can keep up their own supply. Breeding for sale on a considerable scale can only be done to profit when there is cheap land on which to keep mares and yearlings; but better land is needed to fit three year-old colts for sale.

Hacks cannot be bred to a profit on any land; they are chance animals, and along with occasional good ones many useless animals will be bred which will not pay for their keep. Hunters will not, on the average, pay for breeding. It is of no use trying to breed and rear them on poor land; and on good land cattle or sheep will pay much more, make a much quicker return, and with much less expense and risk. Hunters cannot be sold, on an average, under 4½ years old, and need breaking and expensive care.

I have known several farmers give up breeding horses, and very many, who formerly bred a few, have given it up; indeed, very few now breed unless they have an old mare that is not worth selling, and which they do not like to kill. For many years I bred more hunters than any one in the Borders, except Mr. Calder, in Berwickshire; yet, although I have sold many individual animals for high prices, I am well aware they never paid me nearly so well as cattle or sheep would have done. Indeed, they generally proved a loss; and but for the pleasure of having such animals to look at, educate, and ride, I should not advise any one to breed them.

I never knew of any farmer giving up breeding cattle or sheep in favour of horses.

When rough grass, only fit for cattle, has been drained and fined by lime, &c., sheep are found to be more suitable and profitable. Shorthorns are found to be faster growers and more easily fattened than any other breed of cattle. Sheep are bred and fed, according to the land and climate; on low and good land none grow and fatten so fast as the Leicester; on higher lands and more exposed, half-bred Leicester and Cheviot sheep are more hardy and thrive better, although a little slower in fattening.

On the higher hills Cheviot ewes pay best, and are much used to breed half-bred lambs with Leicester rams, which are generally sold to supply pasture and turnip farms down the country, and to south-country farmers.

The best sort of horse for the farm that I have ever seen is a cross between the improved Clydesdale horse and the old Northumberland mares, descended from the tribes known as Culleys, Bakewells, and Vardys. They have more strength, greater activity, and quickness of step than any other.

G. A. Grey.

19. HAWKHILL, ALNWICK, NORTHUMBERLAND.

It is my opinion that more cattle and sheep might be bred than are at present. Not so horses, which to breed and rear are the most expensive, most exhaustive, and most uncertain stock a farmer can have; and even at the present high price of individual good ones, rearing them does not pay. Colts, to be properly matured, should be well fed from their birth, not only with the best of pasturage, but with artificial food. This feeding, together with what they cost at birth, through risk and sacrifice of dam, sire-fee, &c., amounts to more than the average price which they bring in market.

Under ordinary circumstances—that is, where there is little or no proper accommodation for breeding and rearing cattle—it would be found cheaper to purchase than to rear them. Under the general mode of rearing by hand they are so liable to ailments—"scour" when calves, and "quarter-ill" or "black-leg" when yearlings, which carry off in many places a large percentage of them—that the purchase-system is found to be best. Yet there is no doubt that if cattle could be well reared from their birth, it would be very advisable to breed them, and in no manner can they be so satisfactorily brought up till 8 or 10 months old as by allowing them to suckle their dams. Where there is convenience for so doing, a regular stock of Shorthorn or polled Galloway heifers, 2 years old, should be bought in direct from the pastures or folds every spring, and put to a Shorthorn bull. They should calve the following spring (in April or May), and after suckling their produce till Christmas, they may be fattened off that winter. This system insures strong and healthy calves; besides, little or no risk is run of introducing any prevailing epidemic on to the farm, and the young stock are much easier carried on than hand-reared animals, as they never lose their condition, and arrive much sooner at maturity.

There are some circumstances which render the purchase of lean sheep absolutely necessary, such as on a farm which may be termed entirely arable and under the four-course system. In this case very few breeding-sheep can be kept, consequently, if the land is light, sheep must be bought to consume the turnips on the ground. "Eating on," as it is called, is so beneficial to chalk, gravel, or sandy land, that many instances have been known of farmers allowing their roots to be so consumed without any money-payment, but stipulating that the sheep must consume at the same time on the land a certain amount of cotton- or linseed-cake. Where there is a proportion of permanent pasture, and the tenant is not bound to a particular rotation of crops, but can allow the land to remain three or four years in grass, and then, after applying lime, take crops of corn and roots alternately, a great many sheep may be bred and fed on a small acreage.

Under no circumstances have I known the breeding and rearing of horses more profitable than the breeding and feeding of cattle and sheep. In my experience, sheep-breeding is more profitable than that of cattle. They can be bred and reared under almost any circumstances, on poor land as well as on good; and, though the more personal attention that is given to them the better, they are more self-dependent than cattle. As a rule, they are less subject to disease, and less affected by any prevailing epidemic; they are also less liable to the latter during transit to market, while they are not nearly so much affected by railway conveyance.

I have known several farmers who, under favourable circumstances, reared ten or twelve colts every year, but gave up the practice entirely because it did not pay. I do not know of any one who gave up cattle and sheep for horse-rearing. I know of some who, on mixed-tillage farms of a strong or good body of soil, have given up sheep, and, instead, buy in every year a large stock of lean cattle to feed. During summer the animals get artificial food, with grass; and what remain unfattened off grass are finished during winter in the folds on roots and artificial food. Others I know who, on hilly and light-land farms, have given up keeping a greater stock of cattle than was necessary to convert the straw grown on the farm into manure, and have in consequence greatly increased their sheep-stock. The advocates of both systems of stocking are satisfied that they have changed for the better.

The most useful agricultural horse in the north of England is the produce of the clean-legged Bakewell mare and the Clydesdale sire; while almost every county in England has a breed of sheep which long experience has proved to be the best adapted to its soil, climate, and requirements, such as the "Border Leicester" on the generality of farms in Northumberland, and the "Cheviot" on the hills in the same county; the large "Lincoln" in the midland counties, and the various breeds of "Downs" on the fine herbage of the chalks. The Shorthorn breed of cattle is found to thrive in every county. The Shorthorn is not only of itself the most valuable breed in existence, but it alone will cross with and improve all other breeds for fattening purposes.

L. C. CHRISP.

20. CLUNY CASTLE, ABERDEEN.

Farmers could not, with profit, until the recent great rise in price, be expected to breed horses, considering the great expense and risk which they run by so doing; and even now, the high prices which can easily be obtained for good animals are not more than a farmer would require to reimburse him for the keep, other expenses, and risk connected with keeping brood-mares and their produce up to three years old, when the young animals are fit for work. It would not pay a farmer to keep a stud of mares for breeding-purposes on a farm, even if the present high prices of horses could be looked upon as permanent. The only profitable way in which a farmer can rear them, is by having a few well-bred mares forming a proportion of the agricultural horses on the farm, and arranging the work so as to be able to rear a foal annually for every two pairs of horses kept. Thus, on a farm requiring six pairs of horses, an average of about three foals might be reared annually. The breeding of horses is not, like the breeding of sheep or cattle, limited to particular soils or climate.

There are very few farms in this country on which horses cannot be reared, though keeping a farm mainly for horse-rearing is not considered so profitable as cattle and sheep stocks are.

The great difficulty of getting, in the public markets, horses which are sound and fault-free renders it very desirable that farmers should breed at least as many as they require for their own use.

With regard to Cattle, there can be no hesitation in saying that, as a general rule, farmers could with profit in several districts breed and rear more of them than they do at present. Instead of sending so many of them from market to market in a lean state, running the risk of disease and exposure to cold—and from these causes, added to want of proper food, weakening their constitutions, and in too many cases carrying infection along with them,—it would be more advantageous if an attempt were made, where the circumstances permitted, to combine the breeding, rearing, and feeding of cattle by the same person, who would then have an interest in selecting good animals to breed from, and in having the animals continuously well treated, and fed properly till they were fit for the butcher.

There may be a few farms on which cattle cannot be profitably reared; but I have no doubt it would be attended with profit to the farmers themselves, and benefit to the public at large, if the tenants of excellent farms in several districts of Scotland—whose stock at present principally consists of bought-in lean Irish and English stirks—would, instead of this kind of stock, keep good healthy breeding-cows, and cross them with pure-bred Shorthorn bulls. They would find that this home-bred stock would be better animals, would come earlier to maturity, and leave a better return for the food consumed than the ordinary lean-stock now purchased. These, as a rule, are not carefully bred, and are often a long time stalled up and consuming food before they begin to thrive, in consequence of previous exposure to cold, want of regular food, and general deterioration arising from the long distances they are sometimes travelled by steamboat and railways.

In the memory of the present generation it was the universal custom in the county of Aberdeen, and other northern counties, to rear lean-stock exclusively, and sell them to be fattened on the rich pastures of England. This state of things has beeen gradually changing, until these counties are at present pre-eminently cattle-feeding districts. What has proved so successful in the cold climate and comparatively poor soil of Aberdeenshire ought not to be a failure, if fairly and judiciously tried, in the districts of England and Ireland which are at present mainly, if not exclusively, devoted to the rearing of store-cattle.

There is no doubt whatever that the recent extraordinary rise in the price of ordinary manual labour, and in tradesmen's bills and manures, tend to make the results of arable farming less profitable than formerly. Farmers, who at the time of the Rinderpest were led to purchase sheep, and keep a small proportion of them along with cattle on their farms, still continue to do so. This shows that they found the system profitable. The number of sheep kept on arable farms in the north-eastern counties of Scotland has lately been yearly increasing.

Some farms, from their altitude, are not suitable for feeding, and yet pay well as breeding farms. The rearing and feeding of sheep might be combined with profit upon arable farms suitable for them, and of such an extent as to warrant the necessary expenditure connected with the employment of skilful shepherds. The greater portion of such farms should be left in pasture, and the cultivation of it so arranged as to provide sufficient winter food for the proportion of the sheep which should be sold to the butcher. The enormous rise in the working expenses on arable farms, mainly, if not exclusively, used as grain- and beef-producing farms, suggests for consideration whether it would be attended with profit and general advantage to have a larger proportion of such farms under permanent pasture, and introduce, to some extent, well-bred sheep suitable to the soil and climate. Instead of working them on the five shift with two grasses, which was, and to a large extent still is, the general practice in the north-eastern counties of Scotland, this rotation of cropping is now almost universally condemned, in consequence of the increased working expenses and its exhausting effects on the soil. As far as circumstances admit, the breadth of land under grass is being increased, and, as already stated, the number of sheep kept is now considerably more than it used to be, clearly indicating that the farmers find the change profitable.

On farms of limited extent, on which a stock of cattle are kept, it is considered more profitable to purchase lean sheep and to feed them off, than to attempt the breeding and feeding of sheep combined.

In 1873 we commenced to keep Cheviot ewes crossed with Leicester tups on the Home-farm of Cluny. The prices fell in 1874, which affected our valuation at last Martinmas. Notwithstanding the fall in prices, the sheep-account left the same amount for rent as we used to get for the grass-parks when they were rouped. Our accounts for this year are not yet made up; but I expect they will show a very fair return at Martinmas.

Clydesdale agricultural horses, Shorthorn cattle or Shorthorn-crosses, and half-bred sheep, are considered best suited for this part of the country. Farther up the country, the Aberdeenshire Polled cattle are found to suit very well; and in the cold, bleak, exposed parts of the Highlands and Islands the hardy, hairy-coated West Highland cattle are likely to remain the dominant breed. Possibly these may be improved by Shorthorn bulls, the same as the polled cattle and all other local breeds have been.

RANALD MACDONALD.

21. HUNDALEE, JEDBURGH, ROXBURGHSHIRE.

I think farmers would profit by breeding more cattle and sheep. On heavy, strong, clay land and under regular rotation, where it would be unsafe and unwise to employ young and unseasoned horses, breeding them would be unprofitable. On the other hand, breeding horses would pay on light and low rented land, more especially where there is a quantity of hill or outlying land. Horses could be bred and worked until they were five or six years old, and sold as part of the cast of the farm, or at an earlier age, as circumstances might render necessary.

As a rule, I think it would be profitable to breed a larger proportion of cattle on feeding farms. 1st. Because there is every inducement to keep the calves in an improving state from the period of their birth onwards. 2nd. It greatly lessens the danger of catching disease, and gives the occupier of land a regular and interesting employment during a greater part of the year. The only description of land which would warrant the purchasing of cattle for feeding is where the rent is very high per acre, and where the greatest amount of income is derived from the produce disposed of in a raw or unmanufactured state.

My experience and observation lead me to the conclusion that in the south of Scotland and north of England a mixed stock of cattle and sheep is the safest and most profitable; but were I to distinguish between the two, I venture to say sheep would pay best. The rainfall in the district referred to is moderate, and sheep thrive better than cattle in a dry climate.

The description of agricultural horses best suited for our part of the country is the Clydesdale. Personally I prefer a cross-breed between a Clydesdale sire and a dam with a little breeding. Cheviot sheep are best suited for the Border Hills. By far the largest proportion of the arable land in the south of Scotland is best adapted for the breeding and feeding of what are called Half-bred or Leicester-Cheviots, that is to say, a cross between a Leicester tup and a Cheviot ewe. The cattle most suitable for the district are those by a pure-bred Shorthorn bull and good strong dams of almost any breed. As a rule, for agricultural purposes generally, cross-breeds of cattle and sheep are best adapted for the district, being more robust in constitution, and when fat the carcases command a higher price per pound than pure breeds.

William Riddell.

22. Biddenham, Bedford.

I think a large number of British farmers might, with great advantage to themselves, breed more cart or agricultural horses, cattle, and sheep, especially cattle, and particularly those farmers occupying what are termed mixed farms. On all such holdings it must answer to keep a few well-bred cows. Some of the best managers I know, not only wean the calves, the produce of their own cows, but purchase others from those who keep cows to supply milk either to the London or local markets. These men have always animals to sell either as beef or stores. Great as the improvement is in the use of well-bred bulls, there is yet room for much more. It is highly desirable that in all our milk, butter, and cheese-making districts good bulls should be introduced. The Birmingham spring bull sales during the last few years have been the means of introducing large numbers of well-bred bulls into the midland counties, thus conferring immense benefits, not only upon the breeder, but upon the country at large. It appears to me that these sales might be advantageously extended to other districts in England.

On light-land farms, when much work has to be done in the spring and early summer months, the breeding of horses is found inconvenient; but even on these farms of late years, in consequence of the high price of horses, breeding has been introduced to a small extent. On heavy-land farms, with a good proportion of grass land, the breeding of agricultural horses can with greater advantage be carried out, and profitably too. Where these horses are bred, namely, the midland and fen districts, foals have made this season over 40*l.* each, and two-year-old colts over 100*l.* There is no class of animal that will pay better than this.

On all the fine grazing lands of the country, where rents are high, it would not answer to breed cattle. The grazier could not afford to keep animals so long on the farm; besides, where breeding is carried out, at least successfully, it is necessary to have a supply of straw and roots. Also on farms that are almost exclusively arable, where cattle could not be kept in the summer, breeding could not be carried out, therefore it is preferable to buy stores. As is the case to a larger extent in this and adjoining counties, cattle are purchased in the autumn; they are either made off fat, or sold to the graziers in the spring.

On farms where a large extent of roots is grown, a larger number of sheep can be wintered than could be advantageously bred, such farms not affording much summer food.

Agricultural horses do pay to breed, there being but little risk. A man, however, may breed half-a-dozen nags, and, perhaps, find only one good for anything. They must be very exceptional circumstances indeed that would make the breeding of horses (even agricultural to any great extent) more profitable than that of cattle and sheep. My "experience" would lead me to say that in a very large majority of the farms of this county sheep are more profitable than cattle, for this reason, the herbage and climate are more adapted to them. Even on a great deal of the second-rate grass land, a better return is found to be made with sheep. A farmer finds that a good clip of wool comes in very handy. On mixed farms (arable and grass) both cattle and sheep can be advantageously kept.

The Leicestershire and Lincolnshire horses are almost exclusively used in this county. They are either bred or bought at two years old, and are worked until seven or eight years old, and then find a ready sale for the London or provincial markets.

Shorthorns are almost the only cattle bred in the county. A larger number are bred than formerly, and these, too, of improved quality. A few Hereford steers find their way into the county, their great docility making them favourites as yard beasts. They are also thought to fatten more readily on our second-rate grass lands, but as they put on more fat in proportion to the lean meat they are not sought after by our local butchers, but generally find their way to London, where a better market awaits them. Shorthorns are gradually extending themselves, and will doubtless exclude other breeds in this county. They make a greater return in much less time; and having more lean meat, they are more eagerly bought up by the butchers.

Thirty years ago the great majority of the flocks of this county were of the Leicester or Long-woolled breeds. Crossing was, however, introduced, the result proving satisfactory. Such flocks are now the exception. Rams of the Oxfordshire breed are now extensively used; and in the early spring months, sheep at about thirteen or fourteen months old, of most superior size and quality, are disposed of at our Bedford fat-cattle markets. Cotswold and other long-woolled rams are used, but not to the same extent as formerly. The fashion being more for a black face and leg. Thus it appears the Oxfordshires are "best suited for our own part of the country:" at all events, sheep possessing dark faces and legs with a good fleece of wool are rapidly extending themselves.

CHARLES HOWARD.

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23. DALGAN PARK, SHRULE, HEADFORD, MAYO.

I am of opinion that British farmers, and especially farmers in the province of Connaught, in Ireland, could and should, for their own profit and advantage, breed more horses, cattle, and sheep, than they do. But I should say that, like all rules, there are exceptional cases. For instance, if a farm be purely a tillage one, the farmer must necessarily be short of pasturage, consequently it will be more to his advantage, or at least to his convenience, to purchase his supply of horses, though (with convenient farmstead accommodation) I believe it would be more profitable for him to breed, and to rear them by hand, feeding in loose boxes. This, however, entails an amount of trouble and inconvenience which few care to attempt. The same rule will, in a great measure, apply to cattle and sheep feeding. On a farm purely tillage, with a short supply of grass land, it is more profitable to purchase stock for fattening on roots and artificial foods, than to rear and feed fat a much smaller number. Again, on a grass farm of good fattening quality, it is more to the advantage of the farmer to purchase store stock of age, and in forward condition, so that in a few months he can have them finished for the fat market, thus bringing in a quick return and fair profit.

I know one or two gentlemen who formerly bred horses on a very large scale, who have now, to a great extent, given it up, partly because it did not pay a high interest, but more on account of the constant annoyance and disappointment connected with the management. The agricultural horses I find most suited to my farm, and I should say best adapted for the west of Ireland generally, are active, clean-legged animals. My own are chiefly crosses between the Clydesdale and Suffolk Punch. The breed of cattle I like best is that which approaches nearest to the pure-bred Shorthorn, and the sheep almost the pure Border Leicester, though a little of the Irish or Roscommon blood, to give a little more bone and a hardier constitution, is an advantage.

The course I adopt on my own farm (and which I observe is pretty much the system followed by Mr. Simson on his very extensive farms in county Mayo) will bear out what I have thus very hurriedly stated.

As a general rule, I breed and rear a good many horses, selling the saddle-horses when trained at four or five years old; the draught horses after they have been trained and worked on the farm for a time. I breed and rear a number of cattle, and finish them for the fat market at two and three years old.

I breed, rear, and feed off fat all my own sheep. I rarely buy a sheep (rams excepted), and rarely sell a sheep, except to the butcher. My experience in the west of Ireland has been, that the mixed system of farm husbandry, breeding, rearing, and fattening of cattle and sheep, has been the most certain to produce a profitable result. The general practice of this part of the country, however, is very different; the large farmers, or graziers as they are commonly called, almost invariably confine themselves to the grass alone, saving some for hay, barely sufficient to give their stock (which are entirely outlying in winter) a little in the months of spring, or during very severe snowy weather. It must be admitted that stock fed in this way sometimes return very great profit; but at times little or nothing for their grazing.

I consider my sheep-stock too highly bred to stand the hardship to which most flocks are exposed; in fact, it is my opinion that without hand-feeding and attention they would not suit the damp climate of the west. I feed my sheep off fat at one year old. As a rule, the sheep of the country are fed in Connaught till they are two and a half years old, when they are sold to men having fine fattening land, or to tillage farmers for turnip feeding.

ALLAN K. ALGIE.

24. AYLESBY, GRIMSBY, LINCOLNSHIRE.

Farmers could not generally breed more stock; in individual cases it might be so.

On farms where the horses work hard and live high, breeding is very uncertain. On other farms, where mares are worked more lightly, and are not kept so high, and can be spared for a few months altogether when the spring seeding is finished, breeding is profitable.

Some farms are unhealthy for breeding cattle, and young stock do not thrive well, and losses are considerable: on all such, buying is better than breeding.

In our county, the wold and other light soils are much more adapted for breeding sheep, being much better suckling land. The marsh and fen land, on the contrary, is better for growing and feeding sheep.

Horses are not good stock on land; they graze the pastures badly, and are not good manure-makers. There is greater risk from the numerous causes which render horses unsound, and horse-dealing does not commend itself to many farmers.

To the English farmer, sheep are the more profitable, except in certain circumstances, where land is well adapted for cattle-breeding, and not so good for sheep; but generally sheep pay best; they grow fleeces, cattle do not.

Some "horsey" men, who seem to have a passion for horses, will extend the breeding of them to as large an extent as they well can, but not to the exclusion of the other classes of breeding.

A few cattle-breeders have been known to relinquish or lessen that branch of their business, and to breed sheep more extensively.

Lincolnshire and Cambridgeshire horses, Shorthorn cattle, and Lincolnshire "Long-wool" sheep for this part of the country. Downs and Short-wools are better adapted for some soils.

FRANCIS SOWERBY.

25. HOWGILL CASTLE, PENRITH, CUMBERLAND.

I decidedly think farmers could breed more stock with profit by the drainage of wet natural pasture and the top-dressing thereafter with lime or bones. Farms contiguous to large towns, and consisting of rich, high-priced land, render purchasing preferable to breeding horses. And, on the other hand, on soft, grassy, coarse-herbaged, low-priced farms, it is better to breed them.

Land rented, say from 2*l.* 10*s.* to 5*l.* per acre, can be turned to more profitable account in fattening than in breeding cattle. Farms designated as turnip and barley farms, have, as a rule, an acreage in turnips largely out of proportion to the acreage in pasture. And as all such farms, to be kept in first-class condition, demand the consumption upon the fields where grown of all the turnips that can be spared from the making down of the straw into proper manure, the folding on of sheep is practised. Fattening in such circumstances yields a better return than breeding; hence purchasing of sheep is resorted to. Further, when such farms adjoin large towns, where hay almost always commands a good price, the seeds or young grasses are generally reserved and cut for hay; and wherever such is the case, sheep cannot be bred and reared for lack of pasture, but must be purchased for consuming the turnips.

Scarcely under any circumstances do I believe the breeding of horses to be more profitable than that of cattle or sheep; and only on high-lying situations, say from 700 to 1000 feet above the sea-level, and where the soil is of a soft marshy nature, producing rough coarse herbage, is it that the breeding of horses equals that of cattle or sheep. Still the fear that it is unwise "to pack all our eggs in one basket," induces me to recommend, on almost all farms of any extent, *mixed breeding*, and I practise what I preach by breeding a few horses, a number of cattle, and a large lot of sheep.

Sheep, as a general rule, pay better than cattle, chiefly from the light expense in attendance; and also from the fact that in open winters, and where there is an average amount of natural or artificial shelter, with some heath to run over, they can be brought through (in many cases) without any hand-feeding whatever.

From ten to twenty years ago the breeding of horses was largely curtailed on account of their unremunerative market value; and, as a matter of course, their place would be filled with cattle or sheep, but I am not aware of any single individual having given up to any large extent the breeding of horses. Since the reaction in the horse market, there are, if not two for one, most certainly three for two mares put to breeding now, as compared with a few years ago.

The pure Clydesdale horse of the largest frame and weight is not necessary for farm purposes. A lighter, quick-stepping, half-bred animal, is more suitable for this part of the country for farm work; but for working on the farm for perhaps two years, and then selling for town purposes, the Clydesdale is best.

The best sort of cattle are the Shorthorns, and the purer the pedigree the better. On the mountain ranges and unenclosed commons, the Highland or Black-faced sheep predominate. On the lower-lying and inclosed pastures, a cross between the Leicester ram and Black-faced ewes gives a good return. And in the vale of the Eden, and all low-lying sheltered situations, Leicester or half-bred pays best.

JAMES MITCHELL.

26. STEVENSON MAINS, HADDINGTON, N.B.

I think more cattle, sheep, and horses might be profitably bred on many farms.

I consider it most profitable for the farmer to breed his own horses, unless strong, clay soils, where the draught is very heavy. On such soils the mares are more apt to abort or produce weakly foals; and young colts, when first yoked, are apt to produce sprains and other lameness, also to slip shoulders. The same rule applies to very steep land.

On dry arable land, with a fine climate, such as the lower part of East Lothian, I think store-cattle can be bought cheaper than they can be bred, for this reason, that there are other counties better adapted for rearing cattle, viz., those counties which have a more humid climate better suited for grass. Cattle grow better in those counties. I would instance Westmoreland and the greater part of Ireland. On such land as the lower part of East Lothian cattle do not take on the same appearance at all; they get brown and dry in the hair, and do not grow like cattle that are grazing on land better adapted for grass.

Dry arable land that will grow good grass and turnips is suitable for breeding sheep. If the land is naturally very fertile, and of easy access to towns, it will be found more profitable to purchase than to breed, because they can be bred at less expense on poorer soil and further from market, and on cheaper land. Sheep also do best going thin on the ground.

One drawback to the breeding and rearing of horses is that they are not nearly so good manure-makers as cattle or sheep. Grass depastured by horses will not improve nearly so much in condition as land on which either cattle or sheep graze.

The Clydesdale I believe to be the best agricultural horse. He combines strength with durability and docility. Shorthorn or cross cattle, and half or three-parts bred sheep are best.

ADAM SMITH.

27. AHARNEY HOUSE, BALLYRAGGET, IRELAND.

For the past twenty-five years—in fact, since the famine period of 1846–7–8—a revolution in husbandry has taken place in Ireland. Small holdings have disappeared and are disappearing. They have been turned into large holdings, and apace with this process the agricultural population has emigrated and is emigrating.

The change has brought with it this result, that there are now in Ireland nearly 1,200,000 acres less of cereal crops grown than there were a quarter of a century ago, and of course a corresponding diminution of green crop. This serious transition from tillage husbandry to pasturage has had a most vital effect upon stock-breeding in Ireland.

The demand for agricultural horse-power has materially decreased. The tillage husbandry that has ceased was carried on mainly by the small holders of land, who maintained horse-power jointly and severally amongst each other, considerably beyond what was needed upon a large estate system. They combined their farming with breeding horses. The small farmer's mare produced her annual foal, keeping up a regular succession for the horse-market, and enabling the small farmer to recoup himself for the excess of horse-power he maintained upon his holding.

Few if any of the large holders keep brood mares exclusively for breeding purposes. Notwithstanding high prices, horse-breeding is regarded as uncertain, expensive, and requiring skilful personal care and attention of servants or labourers, at present difficult to procure.

As a general rule, tenant-farmers do not and will not adopt horse-breeding *per se* as a mode of farming. They regard cattle and sheep as more certain and profitable. Gentlemen farmers and owners in fee are now tempted to do more in that way, but are deterred by the difficulty of meeting with steady careful servants upon whom the results would turn; and this drawback is increasing. I may add that suitable sound stallions of the different classes are not generally accessible.

As to cattle in Ireland, many sincere well-wishers of the country have indulged in the fallacy that Ireland being adapted generally by soil and climate for grazing purposes, it was best that tillage should give way to pasturage. Those theorists are not aware that more horses, cattle, sheep, pigs, &c., could be "raised," and more beef and mutton brought to market under a system of rotation husbandry suited to the particular soil. In the first place, the tendency and effect of the present or modern system of running indiscriminately into grass farming is to revert to the old barbarous mode of husbandry—leaving the surface to nature—ignoring the improved husbandry of the age and the aid of machinery, &c. In the next place, our winter keep is thus made a limited quantity, restricted mainly to the hay crop, which is in our climate a very precarious provision when unaided by grain, straw, and turnips.

As it is, our local cattle-mart is entirely influenced by the export market—more especially the store-cattle trade. If owing to any causes the English or Scotch import trade experienced a check, a complete reaction—nay, panic—would set in on this side of the Channel. Winter fodder would go up, store-cattle run down, and in the hands of holders run out of condition.

The increasing scarcity and dearness of labour is causing the larger holders of dairy farms—the extensive breeders of cattle of a good class—to give up that line of farming. Indeed, the class of maids, and skilled, careful, and trusty persons requisite for dairy purposes, have become so hard to get, that large breeding establishments of cattle have been broken up generally throughout the country, more especially within the last five years.

The tendency is to have cattle-breeding restricted to the small farmer, whose own family—wife, daughters, and sons—can carry out the dairy operations. These form a limited class, and are decreasing, despite the high price of butter (owing greatly to foot-and-mouth disease).

I feel bound to say that, as a nursery of good cattle, Ireland, under present circumstances, is retrograding. It will be found that Ireland can only be regarded in future as a breeding depôt of a limited quantity of cattle for the

United Kingdom, with a tendency rather to decrease, and certainly not to be further developed under existing conditions. I speak especially of good class cattle rather than the mountain breeds.

Whilst cattle are allotted the cream of the pastures for the sake of beef and butter, sheep are put, as a general rule, upon secondary and inferior soils. Of course there are exceptions to this, especially in the western provinces, where large tracts well suited to the growth of mutton are devoted exclusively to sheep-farming. These are peculiar soils in the hands of large holders, who for a lengthened period have adopted this class of (to them most profitable) farming. They have sound sheep pastures, and their aim is to produce weighty sheep for the market.

Those who have given up tillage husbandry in other parts of Ireland, and whose lands are not of a quality to sustain cattle, have been obliged to turn to sheep-farming, in many instances with soils utterly unsuitable for permanent pasture. They tried the higher classes of sheep, Leicester and Border-Leicester, but they degenerated in large quantities during our wet winters; and when these holders reverted to hardier mountain breeds, they found them continue mere stores until three or four years old, and even then they were unable to turn them into mutton for want of the "finishing" pastures of the western men, and they had no turnips to substitute. Such experience as this has tended to check the increase of sheep in Ireland, which otherwise might have ensued after the great change into pasturage—especially of lighter lands—that has taken place within the last twenty-five years.

On the whole, then, I look upon sheep-farming in Ireland as a limited business, and as not capable of much, if any, further development under existing conditions. Our climate is exceedingly adverse to sheep, especially of the higher class, and to "quick return," unless they are nursed with artificial food in winter.

Extensive arterial drainage by Government, combined with thorough drainage by particular owners, would develop sheep-farming, and improve both the arable and waste lands of the country to an enormous extent, and compensate in some measure for sheep-folding or artificial feeding—decreasing proportionably with the disuse of tillage. Scientific husbandry has diminished apace with our agricultural population, and this bodes, so far, permanent cessation of tillage: because, with our undulating surface and rugged soil, machinery is not so adaptable as upon the friable plains of the sister isle.

Mulhallen Marum.

28. Altyre, Forres, N.B.

Generally speaking, I think that the number of horses, cattle, and sheep bred by the British farmer could be profitably increased, but not to such an extent as would materially affect the supply.

Accommodation, in the way of suitable enclosures for grazing young stock, housing, &c., is essential for the profitable and satisfactory management of a breeding-stud. The almost total want of these in the counties where my experience has been gathered has rendered purchasing—as against breeding—the required horses almost imperative. Before the last few years the high price of beef rendered cattle rearing and feeding much more remunerative than horse breeding. Now that good horses have reached such high prices, the attention of the farmer will be more turned to horse breeding, and the money-value of first-class animals at, say, three years old, or when fit for work, will more affect the question at issue—viz., purchasing as against breeding—than "locality," "nature of soil," "climate," &c.

Rotation of cropping followed must regulate the question of breeding as against buying store cattle. Where one year's grass (and that principally hay) is taken, breeding cannot be followed out. The produce of first-class "early-land" will feed better in every way than that of inferior soil and late climate; whereas the produce of the latter will enable a farmer to rear up to a certain age as many, and as good stock, on the same extent as can be done on the former.

Before you can both breed and feed sheep profitably, you must be able to keep two flocks and two good shepherds.

Sheep cannot be profitably reared or kept without the attendance of a shepherd; whereas cattle can be, without the attendants being specially told off and trained for the purpose. Sheep can also be raised without arable land, under a rotation of cropping, being held in connection with pasturage. Cattle (with the exception of slow-growing and Highland breeds) cannot, under such circumstances. On strong clay lands sheep cannot be kept in wet weather, or during the winter months. On rich grazing-lands the number of sheep requisite to consume the produce would so soil the ground as to render pasturage unprofitable; not so cattle.

Clydesdale horses, Shorthorns, Polled—a cross with these, or with either—and our native breeds; Leicester, Cheviots, and Black-faced, or a cross with "Leicester" for sire, and Cheviot or Black-faced for dam are best.

ROBERT WALKER.

29. SHERIFF HUTTON, YORK.

As a rule, the number of cattle and sheep bred formerly in the United Kingdom will bear no comparison with the large number now bred; and the increase is likely to continue to an indefinite extent so long as the improvement of the land continues, and the price of beef, mutton, and wool keeps so high; but the number of horses bred has not increased, but rather decreased, until very recently, when the high price of large agricultural and cart-horses has caused more to be done in that way; but so long as the high prices of cattle and sheep continue, I do not think the number of other kinds of horses bred is likely to increase. Cattle and sheep can be increased to a considerable extent to advantage, and the land materially benefited thereby, with great certainty of a good return; which is not the case with horses. They are uncertain, and very risky, and damage the land as a rule.

The farmer will do well to breed his own horses, that is, all he may require; and he ought, as a rule, to breed double that number: which may be done to advantage. But it is necessary to have some inferior land upon which to pasture the mares when breeding and unable to work, and also the inferior young ones. Unless a farmer has this, he cannot breed horses to advantage, that is to say, very extensively.

Farmers may keep, say, two brood mares to every 50 acres; this would give him about three foals in two years, which he would find quite sufficient. This is more, however, than what is kept. I never find it desirable to keep mares in a state of idleness when breeding; they are no worse, but generally do better, when at work on the land.

The only circumstances to prevent any one from breeding his own cattle, that is as many as he is able to fatten, are when all or nearly all his grass land is capable of fattening, and is too good or, rather, too high-rented to be used for breeding purposes. In this case he must, of necessity, buy rather than breed. The same conditions apply to sheep as to other live-stock. There is an immense number of acres of land everywhere well adapted for breeding sheep, but the animals often have to be removed to be fattened in other districts. As far as possible, it is most desirable that a farmer should breed and fatten his own, for he cannot now make purchases in the open market or fair without getting more than he purchases.

As a rule, the breeding of sheep and cattle is preferred to horses. There is but little risk in the one case, but considerable in the other; and not only the risk and uncertainty, but the grazing, of horses rather extensively tends to the deterioration of the land; while that of sheep and cattle helps to improve it, especially the former, when the land is sound and dry, and otherwise adapted to sheep. Some landlords, and tenants too, object to horses (working-horses excepted) on account of the damage done to trees, fences, and grass.

Many years ago horse-breeding was to some extent given up, and sheep- and cattle-breeding adopted. This was owing to the low price of horses, risk, &c., as before referred to; and with the idea that the railways would, to a great extent, supersede the use of the horse, and that prices would be lower still.

Nothing has increased so much as the breeding of sheep ; and present circumstances—such as the better drainage of the land, abundance of feeding-stuffs, the growing of green crops more extensively, which is much encouraged by artificial manures, machinery, &c.—tend to that increase.

The cart and agricultural horse pays the breeder the best. As for the hunting horse, though the price is high, the breeder meets with too many blanks for the number of prizes. Could nothing be done to prevent any one from breeding from either horse or mare having a natural blemish or unsoundness?

I think there is no class of sheep that will give an equal quantity of mutton and wool for a given quantity of food as the Leicester; and I place Shorthorn cattle in the same position to other breeds.

WM. LINTON.

30. KINNOCHTRY, CUPAR ANGUS.

As a rule, I believe that British farmers could breed more horses, cattle, and sheep with profit. Horses required for wear on a farm are always most suitable if bred thereon, and, under any circumstance almost, can be reared cheaper than bought-in at present very high prices. For the rearing of horses rough outlying pasture, well fenced, is best adapted. However, under ordinary circumstances, on good arable land, I have always found that those reared on the farm were not only best suited for the work, but cheaper, counting everything, than those bought in. There are very few circumstances which I have known, in the course of thirty-five years of farming-life, which make the buying in of store-cattle for feeding purposes preferable to breeding. As a rule, I consider the British farmer should have as many cattle on his holding for breeding purposes as would give him his regular feeding supply. Were this the general custom we should have little or no disease amongst our stock. Imported cattle, or even home-bred bought-in beasts, are those which infect our regular stock with the diseases which we are troubled with. In this district we consider it the most sure system of farming to have a regular breeding-stock, whether of horses, cattle, or sheep—and all combined, when at all practicable—and when such are kept the laird has never any fear of his rent. Nor are the manure manufacturers anxious about the existence of hypothec in such cases. I have known several farmers give up breeding of all kinds of stock, considering that the purchasing of lean cattle or sheep paid better. Those farmers, however, too often fell out of all kinds of stock; the dealers in cattle ultimately having the most of the stock on the farms, as well as the best of the profit.

I consider that, under ordinary circumstances, the breeding and feeding of cattle and sheep combined are most profitable; and I have found that close attention to one kind of breed pays best either as regards cattle or sheep. During a long experience in the breeding and rearing of horses, sheep, and cattle—in horses, from the thoroughbred, Cleveland, Clydesdale, and crosses—I have found that the most useful horse for general work has been a cross between the Clydesdale stallion and the Cleveland mare. They are generally hardy, and go through their work quickly; the Clydesdales, although more easily kept in condition, are slower and cannot go through the same amount of work.

Having experimented on the breeding, rearing, and feeding of several, or almost all our recognised breeds of cattle, and crosses from the pure breeds, I have invariably found the Polled Angus—true to their character as handed down by their first great improver, the late Hugh Watson of Keillor—the most suitable for this district, or I could almost say any district. No kind of cattle yields so much fine beef on the same quantity of food consumed. As an instance of the healthiness of that breed, I may say that I have kept from 40 to 60 Angus cattle during the last thirty years, and I never lost but one by any disease—which was a cow, by grass disease.

Bought-in cattle sometimes leave more money to the feeder per month than home-bred beasts, but they are not so sure or safe stock. Home rearing cattle of good sorts, sold off between 2 and 3 years old, generally leave 1*l.* per month for their keep; if artificial food is given, they leave more. Moreover, until foreign and Irish cattle were imported, disease among our herds was unknown.

THOS. FERGUSON.

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31. EGLWYSNUNYD, TAIBACH, SOUTH WALES.

I think farmers could breed more horses, cattle, and sheep with advantage.

On very poor land, and on arable farms where artificial grasses are not largely sown, I think it would be more profitable to purchase the necessary horse supply. On the other hand, on mixed arable- and pasture-farms, horses, I believe, can be bred with profit, especially cart-horses. On wholly arable farms, it is usually better to buy than to breed cattle. When the climate is very wet, and the land heavy and undrained, it is better to buy than breed sheep.

For farm-work I think nothing can surpass the horses which are bred in South Wales. They much resemble the Clydesdales.

Having kept several breeds of cattle, I find Herefords do better than any other.

In regard to sheep, I would give the preference to Oxford Downs.

W. S. POWELL.

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32. DENBIE MAINS, DUMFRIESSHIRE.

High-rented land suitable for the fattening of cattle and sheep, and the manufacture of dairy-produce, is not so well adapted for the profitable breeding of horses as that at a lower rate. They are most profitably bred on the best class of pastoral farms, which produce abundant though coarser herbage, and grow horseflesh at a lower cost than arable farms, where work is more constant and severe, and the feeding of greater relative cost. Although a great many breed horses on high-rented land, I think the produce could be better employed, and a correspondingly increased number reared in the higher lands to be substituted for them.

The best arable farms are the cattle-feeding ones; and it is not unworthy of notice that, while their occupiers easily turn to breeding, the breeders on inferior and pastoral farms cannot well turn to feeding. It follows that both classes breeding would lower the price, and increase the numbers of lean out of all proportion to fat cattle.

The same circumstances apply to sheep; and the extent of feeding necessarily conforms to the demand for fat stock, and the ability of breeders on lower rented land to supply the store-stock required. Sheep when the sole stock, as is well known, are too thickly planted on good land to compare favourably with those on land where wider scope can be afforded for the same rent.

A proportion of horses on most arable farms, such as 1 horse to every 10 cattle or 40 sheep, is considered most profitable; and in grazing horses, it is a known fact that they do badly if there is no mixture of either stock, and that without any scarcity of grass.

On a fine red turnip-loam the sheep run away from cattle as a source of profit; while, on the other hand, old grass suitable for fattening cattle, or that having a strong tendency to cause rot and foot-rot in sheep, leaves no doubt as to the proper stocking. But, as a rule, I consider sheep most profitable.

I have known farmers change from the breeding of horses to that of cattle and sheep, and the change has been considered profitable; but it is rare indeed that horses are even the main stock of a farm. More have changed from cattle to sheep than *vice versâ*, and both have in many cases been in consequence of a local peculiarity giving rise to some form of disease, rather than the first view of profit and loss.

The Clydesdale, from its combining docility, durability, active movement, and power of heavy draught, ranks the first among British breeds. A good hack is got from a thoroughbred sire and a dam of the Cleveland Galloway pony or lighter Clydesdale.

In cattle, the most profitable for feeding in this district are the crosses between the Shorthorn bull and Ayrshire and Galloway cows; but of a pure breed, the Shorthorn for the better and low-lying districts, the Galloway for almost any, and the Highlander for a very exposed one, is the general allocation. The early maturity of the crosses, the symmetry, fat, and weight of the Galloways and Shorthorns, and the first-rate quality of the beef of the Galloway and Highlanders (the London Scot), are the notable characteristics.

For crossing in Scotland, the Border Leicester gives the quickest fattening-powers, the Lincoln the most wool and largest carcase, while the Yorkshires blend the foregoing qualities. There is no doubt that the Downs and their crosses suit the chalky soils of southern England; and the Leicesters, Cotswolds, Lincoln, and other Long-wools the Midlands.

JOHN MCCULLOCH.

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33. NETTLECOMBE, TAUNTON.

As a rule, good farming predominates in this district; and where this is the case, the land carries a full complement of all sorts of stock; but where bad and indifferent farming exists, the land of course does not produce what it should, and therefore less stock, and of an inferior description, is kept.

At the present time the price of cart-horses is so high that I know of no circumstances which would make the purchasing of them preferable to breeding. Where the farm contains a good deal of meadow and pasture land of a good quality, and adapted for fattening purposes, and where the growing of roots is uncertain, it may be advisable to buy in store stock to meet the requirements of the farm; also where the farm consists almost wholly of good marsh land, but generally the breeding what is required pays best.

The circumstances which render the purchasing of lean sheep and fattening them more profitable than breeding, are where the farm has little or no pasture or meadow, and where the arable land produces good crops of roots, or where the pasture, although of a strong and fattening nature, is liable to produce the rot or bane in sheep.

I am not acquainted with any circumstances which would make the breeding of horses more profitable than breeding sheep or cattle. As agricultural horses are now selling, I believe if one had the right sort of mares nothing would pay better than breeding one or two colts to a 100 acres or so, as these could be kept with little extra trouble; but the less one has to do with hacks and hunters the better. In the former case a fair ordinary colt rising three years old is worth 40*l.* In the latter you cannot sell at this age, nor until they arrive at five or six years old, and then what with blemishes, accidents, want of style or beauty, bad colour, and cost of breaking, the price which one gets is an unremunerative one.

Upon an ordinary farm it is advisable to have a fair quantity of both sheep and cattle; sufficient sheep to eat the turnips, &c., and sufficient cattle to consume the hay and straw; but should it be necessary to keep less of either, the cattle should give way to the sheep, as the latter give a quicker return, and are better manure-makers than the former. Upon high and thin land sheep are of the first consideration.

I know of instances where farmers have given up the breeding of hack horses, of which they bred four or five a year, and replacing them with sheep and cattle, on the grounds of profit. I am not acquainted with any farmer, nor have I heard of one, who has given up sheep or cattle and turned to horse-breeding. I do not know of a man who has changed from sheep to bullocks, or *vice versâ*. The sort of agricultural horse best suited to this part of the country is one which stands about 16 hands high on clean, short, flat-boned legs; which has a light head, good shoulders, and short back.

As to cattle, nothing beats or even approaches the well-bred Devon in this district. They thrive well on high or low lands; and on high, poor land, especially, they distance all competitors. I have known of several instances where the Shorthorns, and the cross between them and the Devons, have been tried, but in almost every case they have again given place to the Devons.

The sheep kept in this neighbourhood are principally Devon Long-wools, and some of the best and most hardy flocks here have been produced by a cross with pure-bred Cotswold rams. These sheep thrive well over great variations in soil and climate; feed well on turnips, and with little or no corn or artificial food; they are fat in April, when they are about fourteen months old, the carcase weighing from 70 to 90 lbs., and the fleece averaging 8 or 9 lbs. each.

GEO. BABBAGE.

34. CARRIGEEN, CROOM, LIMERICK.

It is very doubtful, as at present circumstanced, whether farmers could breed more stock or not. Of course more might be done if the farms were put into a higher state of cultivation, and fitted with better homestead accommodation, &c., &c.

On farms that can be worked under a mixed system (that is, that breed and finish their own stock), I think more advantage than is might be taken of the relative prices of corn and meat, with profit to the farmer and a considerable increase in the amount of meat produced.

In this country, on all good grass lands cattle and sheep pay better than horse breeding. On farms where a regular working staff is kept, it is generally found cheaper to buy than to breed. If mares are kept specially for breeding, and not worked, they are a very heavy item, and a foal dropped under such circumstances cannot be counted at less than from 20*l.* to 25*l.* When risk, number that turn up unsound, accidents, and cost of rearing are taken into account, it is not strange to find that a steady profit off cattle and sheep and the buying-in of the horse stock as required are preferred to breeding horses.

If the mares are worked, as they may be, the number that miss, pick-foal, &c., unless treated with the greatest care and attention, is a great drawback. It also, unless under the owner's direct supervision, gives such an opportunity for idling and letting the work hang behind, that where there is a regular staff, and full work to be got through, the buying of the horse stock is generally preferred to the breeding.

On large farms, where the attention bestowed on the horse stock is such as to secure the proper working and management of mares in-foal, and where there is a considerable break of young grasses, one and two years old, it is an advantage to have some horses to nip the seed stalk, and on such farms it pays fairly to breed. And the same may be said of farms that have any rough grass about their swampy and wet parts, that would rot sheep, and that young stock would not eat. On this latter class, a few idle brood-mares may not pay badly, as they do well on this sort of fare, which is such as cannot well otherwise be profitably consumed.

In all cases where the greater proportion of the farm is in good natural grass—good enough to fatten or carry dairy cows—it is considered better to buy stock than breed. Dairying is, of course, breeding; but, as carried out in this country, the whole resources of the farm are devoted to the production of butter. The calves reared are sold in September, and the "Strippers" every March. Stock to keep up the dairy are bought as three-year-old heifers on the point of calving, ready to go into the dairy in March, April and May.

In all cases where the grass is too strong or rich to carry lambs, it is better to buy feeding-sheep. It is a common thing in this country to find land that will fatten sheep well when aged, but that will not do for lambs or young sheep at all. Generally a mixed stock of cattle and sheep pays best.

The great producer of hunters, harness-horses, hacks, and cavalry-remounts, was the Irish small tillage farmer (that is, the farmer whose holding was too large to be worked by himself and family, and too small to give work for a pair of horses). Such men almost always kept a mare and bred from her, and having a natural taste for a bit of blood, put her to a thoroughbred horse. The produce was sold at from one and a half to three years old, according to circumstances.

For a long period the British cavalry was thus supplied with horses, the best in the world, for about 18*l.* each to the farmer, and at but 25*l.* to the Government; and such was the supply that, for a few pounds extra, a pick of hundreds could be had. This gave dealers colts, the making of hunters, such as cannot now be had at less than from 80*l.* to 150*l.* each. The low price of corn following the potato failure upset all this, and these lands are now in larger holdings, and turned to dairying and the rearing of store stock.

Of course, the rearing of colts at the former rates could not pay, and was only an adjunct to the system under which the country was worked. On such a farm, a colt was easier kept than a few sheep, or a store-beast or two. He fed about the back of fences, did well on a few rubbish-potatoes boiled, picked among the thrashed straw, and consumed the tail-corn, and, in fact, cost little in direct outlay to rear; whereas now, if let at large on a bit of grass, he will eat more than the best milch-cow. He will also select the sweetest of the pasture, and nip close, being a most partial grazier when left at large with plenty to select from.

Until the past few years, the breeding of agricultural horses for sale did not pay at all; but with the present rise in prices, and improved communication with our large towns and England, a good demand can be had at fair prices; and in circumstances already described, a few brood-mares are now being kept on most farms, and pay fairly. As better mares are produced and kept, and a more general introduction of first-class Clydesdale and Suffolk sires takes place, agricultural horse-breeding will probably become more general, as they are safer for a steady profit that the breeding of hunters.

As a whole, in Ireland cattle pay best; but of course there are districts in which this may not be the case. I never knew a farmer who went in for breeding horses as the principal branch of his business, but have known many who kept a few mares and gave them up as unprofitable. I have known many lessen their sheep-stock in favour of cattle (as their laid-down lands became old pasture), but have never known the reverse.

Clydesdale horses, Shorthorn cattle, and large Long-woolled Leicester crosses, are best. Shropshire Downs are now coming much into favour, but I have had no experience of them. I have had considerable experience of agricultural horses, and after trying both Suffolk and Clydesdale prefer the latter, as having the freest action, best feet and legs, less liable to grease by stocking in stable, with a roughness of character and strength of constitution that best fit them for the ordinary every-day usage and work of the farm. Both may be said to be true pullers; but, as a whole, I would say the Clydesdales are best tempered.

For crossing the weedy blood-mares of this country—with the object of again breeding from the mare-produce with a blood-horse to produce hunters—I think the Suffolk best suited; his great carcase, short clean legs, fine skin, and smooth coat, blending best with the blood-horse, and giving the substance required. The white marking of the Clydesdale, and the gingery chesnut of the Suffolk, that will now and again break out in the after-crosses, are about equally objectionable.

LUKE CHRISTY.

35. LAIGHWOOD, DUNKELD, PERTHSHIRE.

At present there is a deficiency of capital in connection with the occupation of land, and were the breeding of horses, cattle, and sheep, more extensively followed, more capital would be required. At the same time, many arable farms are not sufficiently fenced for breeding and rearing either horses, cattle, or sheep; but if more capital could be brought into the cultivation of the land, and farms properly fenced, breeding and rearing stock more extensively than at present would, as a general rule, be profitable to the British farmer; but, with the present capital, state of fences, and taking things as they exist, it is doubtful if increasing breeding and rearing would be profitable.

Breeding of horses cannot be profitably carried out extensively on good arable land near large towns. Breeding and rearing them can be most profitably followed on farms, the arable land of which is of medium quality; with, in addition, a considerable amount of natural pasture, adapted for a run-out for mares and foals and young horses; farmers, therefore, who occupy farms not well situated for breeding and rearing horses, naturally prefer purchasing them from farmers occupying farms like the above.

For the profitable rearing of cattle, a considerable proportion of natural pasture is almost indispensable; it being at the same time not high-rented land. Low-lying, dry, arable lands are best adapted for feeding sheep upon; while the hill and mountain grazings are best adapted for breeding and rearing them. It is therefore more profitable to buy sheep to about what the holding can fatten, which have been reared on high grazings, upon which they cannot be fed, than breeding them on low-lying arable farms of small extent, and often badly fenced. On small arable farms of less than 300 acres, as a rule, with land in its present condition, a sufficient number of sheep cannot be kept to give full employment to a shepherd, and it is not advisable to keep a breeding sheep-stock on any farm without having the advantage of the careful superintendence of a shepherd.

Horses, hacks, hunters, &c., can be bred on all farms upon which cattle can be bred, and with equal advantage, provided the process be properly understood by the breeder; and, perhaps, since cattle diseases have become so numerous and serious, even more profitably; but on the mountain and hill ranges neither of them can be bred and reared so profitably as sheep. In fact, they cannot be bred or reared at all there, these mountainous ranges being adapted for sheep only.

I have known many farmers who have raised the number of their sheep and reduced the number of their cattle, and *vice versâ*, but never any one who did it on a wholesale, or even an extensive scale. When changes were made it was because the farmer, right or wrong, thought his farm better adapted for the one than the other; and also, when the cattle-plague came into the country, and destroyed many herds of cattle, sheep to a certain degree at that time were substituted on some farms.

For low-lying arable farms, I prefer the Clydesdale as an agricultural horse; but on higher lands, where much of it may be steep and banky, I do not like them to be very large. On such lands their weight kills them. As for cattle, on rich low-lying lands I consider the Shorthorn and Angus as not unequal in merit for producing beef; while on many medium farms, where some rough pasture-land is attached, I prefer crosses, a Shorthorn bull with what may be called country cows. Again, when the cattle can be kept out through the winter, on rough pasture with an allowance of natural hay, with woods for shelter, there is no breed I know equal to the beautiful hardy West Highlander. As for sheep, it is impossible to lay down any rule. On the mountain ranges of Perthshire and some other counties, the hardy Blackfaced is decidedly the best breed; while in Sutherlandshire, Dumfriesshire, and other counties, the Cheviot on the highlands is to be preferred, with half-breds lower down.

ROBERT ELLIOT.

36. THE DUFFYRN, NEWPORT, MONMOUTHSHIRE.

If farmers could, I think they certainly would breed more horses, cattle, and sheep.

I think that horse-breeding can never be satisfactorily carried out, unless the farm contains suitable dry paddocks for wintering, and rough pastures for summering the horses. Under favourable circumstances, the breeding and rearing of horses pay well; but I think the more they are kept separate from other stock, the more profitable they become; inasmuch as they are seldom at rest, and are perpetually disturbing other stock. On a purely arable farm, or a farm chiefly arable, purchasing horses will, of course, be found more economical than breeding.

Purchasing store cattle would be preferable to breeding where wintering is expensive; for instance, on a grazing farm, where straw is scarce, or on any farm where straw and hay are saleable commodities, purchasing store stock in the spring of the year and selling them again in autumn would be a more economical system than breeding.

On heavy lands and, as a rule, on purely arable farms, breeding would not be so profitable as keeping dry sheep; as in the first case in winter they would poison the land and not thrive, and in the second case turnips and hay are too expensive keep to make sheep-breeding profitable.

Again, on poor arable lands it is better policy to consume the roots with fattening sheep, and so enrich the land, than to feed them off with ewes, leaving the land but little richer after the turnips than it was before. To breed sheep economically there must be dry sound pastures or downs, so that the ewes may be wintered at small cost. In many districts it costs 30*s.* to keep a ewe from November 1st till April 1st. As a rule this must be a losing game. Moreover, it very often happens that the corn crops are seriously injured by seed-sowing being retarded to allow the sheep to consume the roots. Again, with a regular breeding-flock, in seasons of deficient green crops, you are put to serious straits for want of keep. The sheep are "pinched," or sold at a sacrifice. In keeping a fattening stock, you can purchase according to your requirements; and in seasons of drought and low prices the breeder's loss is the feeder's gain.

I do not think any fair comparison can be drawn between the cases of sheep and horses, because, as a rule, where you keep sheep you cannot keep horses. A few colts among sheep to eat the bents may be profitable, but kept in any numbers among sheep they would not thrive.

As a rule, I think cattle would be more profitable to breed and rear than hacks or hunters, because of the greater risks to the latter; also, because they injure so much keep by their incessant movements. If a farmer has a speciality for nags, can ride them well and sell them well, they may pay very well; but that would be an exceptional case. Breeding good agricultural horses would, I think, compare favourably with any stock-breeding.

On dry arable lands it would be preferable to feed the roots on the land with cake and hay with sheep, to pulling them off and consuming them with cattle in the yards; and even on heavy land, where straw *must* be trodden down, better feed the roots on the land and litter the sheep with the straw. On pastures I would prefer chiefly bullocks, as sheep pick all the finer grasses and injure the land. I know no one who has kept a regular stud farm. As regards horses, everything depends on the kind of work to be done. Light horses, as a rule, for light land, and heavy ones for heavy land. Welsh horses suit the hill country admirably; Clydesdales suit the lowlands. I think Shorthorns suited to almost all districts, and superior to any breed.

R. Stratton.

37. Mill of Ardlethen, Aberdeenshire, N.B.

I am of opinion that the British farmer can, with profit to himself, breed more horses, cattle, and sheep than he at present does. On my farm of some 500 acres I breed all I require. I consider it advantageous to breed horses, keeping in view the high prices they have now attained. In breeding cattle you can bring them earlier to maturity; by housing the calves early in the autumn you never allow the *calf-beef* to go of, and thus have them ready for the market when they are from 20 to 27 months old. I have adopted this system for the past twelve years, and for the last three have realised from 30*l.* to 35*l.* per head.

We have no farms in this quarter set aside for breeding horses, and in general we only breed as many as are sufficient for the working of the farm.

The breeding of hacks, hunters, &c., has never proved profitable here, but the breeding of agricultural horses has at all times paid; and under the exceptional high prices at present would do so fully as well as, if not better than cattle. Whether sheep or cattle are the more profitable depends greatly on the district of country and the nature of the soil they are fed on. Many of the farmers here are keeping sheep in considerable numbers who kept none a few years ago. This can be accounted for in several ways; but I think the principal reason is the high price of labour, for the farmer now finds it more profitable to let some of his thin dry land remain in grass, and keep sheep on it, than to cultivate it.

The principal breed of cattle here is a cross between the Shorthorn bull and the Aberdeen, or cross cow, but principally from the latter. I breed from the Hereford bull and cross cow, and have done so for the past ten years, getting most of my bulls from Her Majesty's stock at Windsor; and I think by introducing the Hereford blood I have improved the constitution, get as early maturity, and as much weight. I consider these crosses, whether from Shorthorns or Herefords, the most profitable to the farmer, and therefore the most suitable for the country. Clydesdale horses are by far best suited, not only for this district, but for the United Kingdom, both as regards activity and durability. Half-bred sheep from the Leicester ram and the Cheviot ewe are the general stock bred in this quarter: but I breed Shropshire Downs, and from the short experience I have had, I find them answer very well, and I have no doubt a finer breed of sheep will soon become general.

R. COPLAND.

38. CUSHNIE, KINCARDINESHIRE, N.B.

Farmers could breed more stock, but not to the utmost extent of their requirements.

Young horses are destructive to wooden and wire fencing, and there is no material for stone dykes in this part of the country; nor do thorns ever become complete fences. When horses were cheaper than they are now, many farmers gave up breeding, finding it cheaper to buy than to breed, and it takes a considerable time to induce any considerable number of farmers again to take to breeding. Young horses are also expensive to rear. The mare, if a good one, is in the first instance costly; many are barren, and a breeding-mare is of little value for work during the time she is in-foal and in-milk; the young Clydesdale progeny is of no use on the farm till three years old, and will not stand for an ordinary horse till four, or perhaps five, years old.

Scotland is eminently a cattle-feeding country, more than a breeding. The milder climate of Ireland enables Irish farmers to breed calves, and to keep them in early youth cheaper than can be done in Scotland. In Ireland cattle can be kept on the open pastures for nearly nine months in the year; in Scotland not more than four, and in winter they must be entirely housed and kept on expensive food.

Irish cattle, if of good sorts, will generally pay more to the Scotch feeder than cattle bred on the farm, if the cost of the first purchase of a herd of cows and bull, with their annual keep, be taken into account Sheep cannot be bred profitably on small holdings, but are increasing on larger farms.

A tenant-farmer paying a smart rent—as almost every farmer does—must have quick returns. Both sheep and cattle yield earlier returns, and perhaps, on the average, greater than horses. Horses on any farm can only be bred profitably to a limited extent.

I have never known of any farmer breeding horses extensively in this part of the country.

I have known of a good many who have taken to breeding sheep in preference to cattle on the ground of profit, the expense of cultivation of poor soils having lately become so great.

The best breeds for this part of the country are—Horses: Clydesdale. Cattle: Shorthorn, Angus, or crosses. Sheep: Blackfaced on the mountains; Leicester, Cotswolds, &c., on the low country.

ALEXR. TAYLOR.

39. PENDEFORD, WOLVERHAMPTON.

Most assuredly farmers could breed more stock on a very large percentage of the farms in this kingdom.

On land principally arable I consider it answers better to buy your horses than to breed them. The mares are required to work at a time they are least fitted for it, and it is a difficult matter to find accommodation for colts on many farms composed almost entirely of arable land. This applies more directly to damp and hilly farms.

There is little food for cattle during the summer months on a large portion of the arable land in this and many other districts.

I do not see much force in the argument used by some that "it is more desirable to buy than breed sheep." If the land is well drained it will pay better generally to breed. If it is not well drained I should suggest buying as a more desirable system.

I consider there is a large area of land more adapted to breeding horses than cattle or sheep. I think horses are more valuable when bred on high or undulating land than in low, flat ground. Muscular action is essential for a beast of burden, and there it is brought into daily practice to the general improvement of the animal. My experience is that sheep are more profitable than either cattle or horses on land adapted to them.

Many cases of farmers giving up horses and taking to sheep and cattle have come under my personal observation. I think the high prices of animal food and wool are the principal cause of the high prices of horses during the last few years. Horse-breeding has become less popular. Cattle and sheep are a more negotiable commodity, coming to market much earlier than horses. The percentage of horses of all kinds that prove unsound before they are four years old is very great. The risk, too, is greater in the horse than in either cattle or sheep; and while a slight defect reduces very considerably the value of a horse, it does not militate against the value of stock bred for the butcher.

I have known instances where the flock has been reduced and the number of neat cattle increased with satisfactory results, where a large proportion of the occupation has been permanent turf. There is great difficulty in keeping sheep free from lameness on such land.

Shorthorn cattle are best adapted to this district, and Shropshire sheep have displaced in this and the adjoining counties all other breeds to a very great extent. I consider the Welsh horse one of the most valuable we have for agricultural purposes, being particularly docile and very hardy. This I attribute to his early training.

R. H. MASFEN.

40. HALKERSTON, GOREBRIDGE, EDINBURGH.

In many places, I think, where there is a part hill or rough ground, stock can be reared with advantage, and fed on the improved part of the farm. Horses pay well where you have rough ground, and I think every farmer in this locality at least should breed horses for the farm. As a rule, they prove more suitable than those brought from a different district. On many arable farms, however, where the soil is retentive at some seasons of the year, the ground gets very hard, and proves injurious to the feet of young colts.

I think there are too few cattle bred. On farms where the five-course rotation is the rule cattle pay to breed and feed. Hay has been high in price, and many farmers have been going in for it, and so have fewer cattle and sheep. In the lower districts the rotation prevents breeding of sheep to a great extent. There is not grass till after the hay is cut, so a breeding-stock cannot be kept in big numbers. Young cattle and sheep do well on first and second years' grass not too heavily stocked with sheep. Agricultural horses do well where the rent per acre is less than in the Lothians.

I know several who now keep sheep in preference to cattle. The high price of labour is one inducement. In place of barley or oats after turnips they sow rape and grass-seeds, and put sheep on it about July. On this fare sheep feed very fast.

In this locality, where the ground is hilly, heavy Clydesdale horses are not suitable. We prefer clean-boned active horses. Cattle cannot be too well bred. Shorthorns, if properly treated, grow and feed at the same time; come early to maturity and great weight. Half-bred ewes, that is cross from Leicester rams and Cheviot ewes, again crossed by Leicesters, make a good sheep, and when well fed yield a heavy clip of wool.

JAMES CURRIE.

41. ESKER TIMAHOE, QUEEN'S COUNTY, IRELAND.

If British farmers had proper security for their improvements in the soil, they could, by high farming, make the country, especially Ireland, produce double the quantity of stock it now does.

Except on very heavy clays or hill farms, where the work is too hard for mares in-foal, it is most profitable for farmers to breed their own supply of horses. When the farmer has good fattening land it is more profitable to buy store-cattle, as men who have cheap light land can rear them cheaper than the feeding farmer can, who has to pay a high rent.

On some of the light tillage land, that will not grow old grass, the buying of sheep reared on hill lands, and fed off on after-grass and turnips pays best, when such can be got. With regard to Ireland, as at present farmed, the good tillage farmer can buy his sheep cheaper than he can rear them. The half of Ireland that is under grass should be under crops of turnips and corn. If every man were cropping and farming as he should, rearing would have to be resorted to. Two-thirds of the farmers, however, are living an easy, idle, life, keeping good tillage land in bad grass, making a living themselves, but doing no good for the country or their countrymen; banishing the labouring men, and sending the money of the country begging for foreign speculation—under these circumstances, buying lean sheep pays the good tillage farmer the best.

The rearing of agricultural horses always pays the Irish tillage farmer better than cattle or sheep, as he can make them work for their food when two-and-a-half years old, but he should only breed according to the number of mares he can keep working. It never pays the farmer to breed hunters, as they will not get a price for them till they are made and aged, and all the profit goes to the dealers and not the breeders. Sixty pounds for a colt four years old will not pay the farmer, and that is above the average price for hunting-colts of that age, as many of them turn unsound and go cheap as hacks and farmers' horses. If the farmers or their sons, who are hunting men, valued the time when they make a horse to sell for hounds, and deduct all the screws they make, there would be very little to the right side of the farm account. Breeding hunters is only for gentlemen who have time and means for hunting.

On tillage lands, where a regular system of cropping is carried out, sheep pay most money, as a pound of mutton is as easy made as a pound of beef, and the wool is extra; and, moreover, they manure and tread light land better than cattle: but on old grass-land, sheep, when heavily stocked, destroy the quality of pastures by keeping the fine grasses down and letting the coarse grasses get up. On this land cattle pay best; and on heavy clay lands, when sheep cannot be fed on the turnips, cattle pay best, but on all well-managed farms a mixed stock should be kept.

I have known several farmers to give up breeding hunting horses and put on cattle or sheep, but I never knew a farmer quit breeding working horses when he did it right. I have known gentlemen of independent means turn to horse-breeding, but I never heard them say, after a fair trial, it paid well. I have known several farmers give up sheep-breeding and turn to cattle; some of them did so with profit, as the lands were unhealthy for sheep, and I have known some turn altogether to sheep-farming, but many of them again returned to the mixed stock system with profit to themselves. It is a great failing of Irish farmers to run from one thing to another as the prices change by the over-supply of some particular stock. One year they will have all bullocks, another heifers, and another ewes, and again wethers, so that the man who sticks to a steady mixed system always has a good market for some of his produce.

The breed of agricultural stock must be regulated by the climate, soil, and general aspect of the farm, also the market to be supplied. In Queen's County a cross of the Clydesdale horse on our mares makes the best agricultural horse; and the Shorthorn bull on our cows, and the Lincoln or Border Leicester rams on the ewes of the districts. On the heavy grass lands the Lincoln cross is best, and on very light soils the Border Leicester.

WM. DAVIDSON.

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42. CHAMBERS OF HIGHLAND AND AGRICULTURAL SOCIETY, EDINBURGH.

I am of opinion that many farmers could breed stock much more extensively; but so much depends on the nature of the farm they possess that it is difficult to say what proportion of the farming community would profit themselves by so doing.

On a farm which has no natural pasture, on which young horses can be grazed at a cheap rate, I do not think horses can be reared profitably. Also when there is constant work for the whole of the horses, such as carrying grain, hay, and straw to market, fetching back manure from towns, &c., the loss of the mare's work while rearing the foal would be inconvenient. If, on the other hand, there is a rough hillside attached to the farm, I would advise breeding horses as largely as possible, consistent with keeping the work going without spoiling the brood-mares.

If a farm is suitable to breeding cattle as well as feeding, I have no doubt that it would be more profitable to breed, rear, and feed-off on the same farm, or under the same ownership even on different farms. Few farms are adapted for both breeding, rearing, and feeding.

For breeding the most classes of sheep, an outrun of rough or hill pasture is required to enable them to be reared profitably. On the other hand, purely arable farms require sheep to consume the turnip crop, and the rent of the land is too high to enable them to rear sheep on it with profit. Many south of Scotland farmers have now farms in the north where they breed Black-faced and Cheviot sheep, and they bring the wethers south and feed-off on their arable farms, thus reaping the whole profit without any middle man getting his share.

My experience is chiefly in the highlands of Scotland, and I am decidedly of opinion that it is most profitable for the farmer to breed both cattle, sheep, and horses. Cattle eat grass that sheep will not, and many hill farms are rendered more healthy for sheep by having a certain number of cattle on them. Horses eat close, and interfere with sheep more than cattle, but a few on a rough hill farm do no harm, and the price of a young horse helps the rent.

I have never known sheep given up for cattle; but about ten or twelve years ago, when the price of wool and of sheep went up so rapidly, a great many farmers in the north reduced the number of cattle. Some gave them up altogether, except a cow or two to give milk. Farmers are now finding that cattle are a profitable stock along with sheep, and are either taking back to the West Highland breed, or to Ayrshires, for dairy purposes.

My county is Perthshire, and I believe the best agricultural horses for it, as for the kingdom in general, is the Clydesdale. For the highlands there was a class called a Highland Garron, which was a miniature Clydesdale, but with more breeding and action. It was a most useful class of horse, but it is rarely to be met with now, the rage for very heavy horses having almost exterminated it. Good ponies could be bred with profit on our hills. Shorthorn cattle thrive well on the low grounds of Perthshire, and Ayrshire cattle do very well; but the country is famed for its West Highlanders, and they certainly are the grand breed of the county, though now reduced to a few herds. All the usual kinds of sheep do well on the low grounds. Leicester pure, and the Leicester and Shropshire crosses, and, on the hills, Black-faced. The breed of the county may be claimed for the Black-faced. There are few Cheviots, the hills are too high for them.

F. N. MENZIES.

43. SHAW FARM, WINDSOR.

The price of live stock being so high at present, and grain cheap, I consider it would be more profitable to the British farmers to breed more cattle, sheep, and horses than they do.

I know of no circumstances which would make the purchasing of the necessary horses required for a farm preferable to breeding the animals on the various farms. In all my experience I never found that horses purchased for farm work did so well as those bred on the farm, either as to health or endurance. The home-bred horse does not cost much in rearing; the dam works the greater part of the time she is nursing him; and until fit for work—under any circumstance—cannot cost the farmer one-half of what he would have to pay for him if purchased. Whatever the nature of soil or situation of farm may be, the horse bred upon it will be found to be the best adapted for the work and cheapest to the farmer.

On upland farms and exposed land, where pasture is bad, it may be better and more profitable for the farmer to buy in store cattle to fatten, but otherwise home-bred cattle will be found to be easier fed, and make a better return to the farmer.

On some farms young sheep do not do well; on wet heavy clays, they are subject to foot-rot and dropsy; on exposed land with hard cold subsoil they are apt to pine and die of consumption; on old pastures where there are coarse grasses, *braxey* and other inflammatory diseases (which young sheep are subject to) prevail amongst them more or less. Under these circumstances it would be more profitable for the farmer to buy in old sheep to feed-off his roots; but wherever it can be done, to breed and feed what the farm can hold is the most profitable system the farmer can adopt.

On cold marshy soil, where cattle and sheep cannot be reared, the breeding of horses is more profitable, but not otherwise.

In my experience I have found that, where the land is dry enough to admit of sheep eating the roots off in winter, sheep will pay the farmer better than cattle; but at the same time, as many cattle should be kept and fed as will make the straw and litter into good manure. This can be done by drawing as many roots as they require, the sheep feeding-off what is left; but on clay and heavy soils cattle will pay best.

I do not know of any person who has given up extensive breeding of horses and taken to breeding cattle and sheep alone. Of late years there have not been so many horses bred by the farmers as formerly, but now when the price is so high I have no doubt they will breed more, especially for their own use. I do not know of any farmer having given up cattle and sheep breeding largely and turned to horse rearing as yielding a better return.

The breed of agricultural horses best adapted for this part of the country, and, indeed, for the United Kingdom, is the Clydesdale breed, both for docility and durability. The Shorthorn breed of cattle has no equal for early maturity, symmetry, fat, and weight; they can be kept with more profit to the farmer than any other cattle. Of course, on the cold east coast of Scotland and the Highlands, the polled and West Highland cattle are more suitable and profitable to the farmer; but in England, Ireland, and south of Scotland, the Shorthorn will be found the most profitable.

I consider the Leicester sheep, as a pure-bred animal, to be the best for early maturity, symmetry, fat, and weight; the Shropshire and Oxford Downs are also very symmetrical, easily fattened, and good weights; but on different districts and farms the different breeds of sheep found upon them are often the best and most profitable for the farmer. In this district very few sheep are bred; the farmers buy Hampshire Downs to feed-off their roots. They are large hardy sheep, and are said to pay better than any others.

HENRY TAIT.

44. ST. JOHN'S WELLS, ABERDEENSHIRE.

Breeding nearly as many cattle as can be fed-off on an extensive farm involves no ordinary amount of labour, skill, and attention at all seasons; and after all, it can only be prosecuted successfully in sheltered situations and with a first-class stock, for it is an established fact that breeding secondary animals is always a losing concern; whereas feeding may be carried on to advantage on the largest and most exposed farms with greater profit and infinitely less trouble and risk.

For several years one-half of the stock fed-off on this farm were bred upon it, till pleuro-pneumonia broke out in the herd about five years ago, which proved exceedingly ruinous amongst cows, calves, and yearlings; since that time I have merely kept as many cows as will supply the modicum of milk for domestic purposes. I purchase two-year-old stots and queys in the months of March, April, and May, at an average price of something over 16*l.* a head.

The queys are generally sold from the grass about the 1st of July, when the better class of the stots are housed on clover grass, tares, and a little oil-cake, and rendered fit for the butcher by Christmas; the others have thus an increased extent of pasture at a time when it begins to decay, and are generally brought into prime condition for the fat market in the course of the spring, when a fresh lot of store cattle have to be bought. The mean length of time embraced in the process of feeding-off would not exceed ten months, and the mean return would be about 12*l.* per head. Referring to the system of breeding as many as can be fed, I shall assume that 100 acres of good land are capable of maintaining 34 head of cattle, and that of these in fortunate circumstances 9 stots are annually fed-off at the high average of 30*l.*, giving 270*l.*; from which, however, you have to deduct losses, which are as sure as seed-time and harvest, chiefly consisting of cows getting out of season, slipping calves; and again calves dying from diarrhœa, navel-ill, knee-ill, and fifty other ills incident to calves, with quarter-ill amongst yearlings; and cost of a good Shorthorn bull, would amount to not less than 15 per cent., or something over 40*l.*, leaving as the net profit, 230*l.* I must also assume that the same farm, if properly managed and attention given to the sowing of tares or beans, and the preparation of a few acres of first grass for house-feeding, a few acres of turnips for early use on the system already indicated, is capable of feeding off at least 24 head of bullocks, which at the moderate calculation of 12*l.* per head, would yield a profit of 288*l.*, while deaths are almost nil. This shows the sum of 50*l.* in favour of buying and feeding. I hold that the feeding-system proves more nutritious to the farm, and that the early housing affords a considerable field-pluck for lambs or young horses, which, with the increased quantity and superior quality of the dung, fully compensates for the extra consumption of oil-cake in the process of feeding.

G. MITCHELL.

45. WOOLSTON, BLETCHLEY STATION.

British farmers could breed more horses, cattle, and sheep than they do, only by an increased production of corn in their own country as feeding-stuff, &c., or by purchase of such food from other countries.

Hard-worked horses on large arable farms cannot do breeding and working together; while lightly worked horses on a mixed arable and grass farm can breed at a profit.

Poor grass and arable land can breed sheep, while it needs good land or roots on root-growing land to feed them.

Until within the last few years the breeding of horses has not been found over profitable; while that of breeding and feeding of cattle and sheep has been found not only profitable but certain.

For many years back many farmers relaxed or discontinued altogether the practice of breeding horses, because it had been found to be unprofitable or of little profit. The breeding of cattle and sheep has never been neglected, while that of horses has.

Strong, active, and powerful animals are the best horses. Long-wool or half-bred sheep suit this district. The Shorthorn cattle are generally bred, while other breeds are fed in this district.

WILLIAM SMITH.

46. PRESTON HOWS, WHITEHAVEN, CUMBERLAND.

From my observation and experience, extending over a period of thirty years, I do not think that the British farmer, as a rule, has made horse breeding profitable. In this county, during a wet summer, I consider *every horse has five mouths*, that is, he destroys as much grass with each foot as he eats; and taking into consideration the risk of barrenness, unsoundness, bad temper, and accidents, there is no margin left for a profit if we calculate the average price that our colts bring in the market at four-years-old. To breed a colt on good land, and feed him moderately upon the produce of the farm, he ought to yield 20 guineas a year, and (granted that the mare is fruitful and the colt fortunate) the average price of a four-year-old is less than 80 guineas.

If at any time from babyhood to maturity a cow or a sheep should break a leg, or meet with any serious accident, the carcase can be used for food, and the animal may be sold for perhaps one-half of its original value to the butcher; but if a horse meets with a similar accident it is a dead loss; there is no salvage.

I believe that the British and Irish farmers could with profit to themselves breed more cattle and sheep then they do. A great deal depends upon the situation and altitude of the farm whether it is more adapted for cattle or sheep breeding, but as a rule, it is better to combine the two, and mix the herd and flock together. There are certain herbs which grow in a pasture which sheep are fond of, and which cattle nauseate, and *vice versâ*. The most profitable class of cattle for this part of the country is the pure-bred Shorthorn, or for grazing purposes use a high-bred Shorthorn bull upon common dairy cows. The class of sheep that will produce most mutton and wool upon a given area of land is the pure-bred Leicester, and the most profitable sheep for grazing purposes is a cross from the high-bred Leicester ram and a Cheviot, Herdwick, or Down ewe. In fact, I have never known any breed of sheep that could not be improved by the use of a pure Leicester ram.

ROBT. JEFFERSON.

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47. SHIELHILL, STANLEY, PERTHSHIRE, N.B.

As a rule I think British farmers could, with profit to themselves, breed more stock of all kinds than is done at present. All that is wanted for accomplishing that is capital, skill and enterprise on the part of the farmers, with some additional security from the landlords for bringing and keeping up a higher standard of cultivation of their lands.

On high-rented lands, where there is not much pasture, I consider it more preferable to buy horses than to breed them. Horses can most profitably be bred and reared on mixed arable and grazing farms, where there is good bounds of rough undulating pastures, with shelter and good keep for the winter. Young horses, if they are well attended to, thrive best on the farms on which they are reared. Brood-mares, when properly cared for, work on close to their time of foaling—when generally the heavy part of farm-work is over. The demand, and prices paid just now, for good horses encourage a further extension in the breeding of them.

Sheep can be most profitably bred and reared on light cheap-rented land, where they have plenty of clean pastures. Cattle thrive and pay best on good loamy pasture lands.

I do not know of any farmer who has bred horses extensively having taken entirely to the breeding of cattle and sheep; but, as a rule, I can state that for the past quarter of a century the breeding of horses has been very much neglected. I attribute that to the low prices of horses at that time; and when the railway system was developed through the country, an idea was formed, which proved to be an erroneous one, that fewer horses would be required for both town and country. The great increase of trade and wealth in the country is the prime cause of the demand for good horses of all classes just now.

I know many farmers who are now breeding more horses than they did formerly; but except a very few, who breed stock for show, I am not aware of many farmers having given up the breeding of cattle and sheep for horses. I am not aware of many extensive sheep-farmers having taken to cattle-rearing, or *vice versâ.* I think the soil and climate are the first things to look to in the rearing of stock. Sheep-stock being more easily accumulated than horses or cattle, are more liable to fluctuation in the markets. I consider the Clydesdale breed of horses the best; and cross-bred cattle and sheep pay the farmer best in this part of the country.

JAMES CHALMERS.

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48. ELFORD PARK, TAMWORTH.

I think that more horses, cattle, and sheep, might be profitably bred.

Horse-breeding, as a particular or important branch of farming, is not much followed in this neighbourhood. A good many horses are bred, but in a desultory way. Outlying fields, rough pastures, and hills, are not features of this part of the county; and horses (especially young ones) need room and shelter, and are often troublesome and dangerous to young stock.

The principal breeders of horses near here are men who are obliged to keep more horses for certain purposes at certain seasons than are usually required, so that an extra mare or two help the work, and the foals pay for keep. I have no doubt that the late high prices of foals have stimulated breeding; but not many more are brought to market than formerly.

The entire horses that travel about here are not good, and I think the difficulty of getting a good one hinders many farmers from breeding. I know of no one who has given up cattle- and sheep-breeding for horse-breeding.

Where a farm consists of rich grass and not much arable land; where the fields are too large to separate the stock into small or desirable numbers; where the standing or steadings are not convenient for wintering stock, either in the fields or in the homestead, it is better to buy than breed stock. There is no doubt that the high price of store cattle, some two or three years ago, stimulated farmers to breed and rear. I have more than once asked the question at a farmer's ordinary, and found that many were rearing twenty or thirty calves who had not done so for many years; and I think that upon ordinary mixed, and particularly second-class farms, rearing may be added as a profitable branch. The drawbacks are extra trouble, labour being bad and dear. Diseases, such as "black leg," hoose, foot-and-mouth, pleuro, &c., are fatally prevalent in some districts, even under careful and liberal treatment.

For some years I have bred and reared about thirty calves, with very different success. The above complaints have killed from 10 to 15 per cent., and in some seasons more. Another incentive to rearing cow-stock is to be found in the comparatively new trade of milk-selling.

Many dairies have given up cheese-making, and now sell their milk to large towns or to cheese-factories; and on many grazing farms, where the turf needed considerable help in cake or corn, milk-selling is found more remunerative than feeding; and as a result, breeding and rearing form a profitable and almost necessary part of the business.

Pure-bred Shorthorn bulls are generally used. Breeding-flocks of sheep from 2 to 15 scores are common about here, and have been for many years; and they are probably increasing, from more land being laid down to grass. Foot-rot, "foot-and-mouth," &c., are the great drawbacks to success in sheep rearing. The loss this year from diseases is simply enormous. As mixed farms are the rule here (that is, about equal portions of grass and arable), it follows that mixed farming is also. Where an extra breadth of roots is grown, store-sheep are purchased; and where farms are unhealthy or unsuitable, hoggets are sold off in the autumn; but these methods are the exception, so we may infer that breeding is supposed to be most profitable. I certainly know no one who has given up breeding horses for cattle or sheep, or *vice versâ*.

The kind of horses bred here are of no particular breed. They are hardy, good workers, have plenty of bone, and stand from 15·2 to 17 hands, generally bay or brown. The cattle are called Shorthorns, but are not of pure blood; are good milkers, fair breeders, and average, when fat, about 90 stones. The sheep are Shropshire, prolific breeders, and good feeders: twelve months old, well fed, average 10 stones; older, and ewes, from 13 to 15 stones.

GEORGE A. MAY.

49. HUMBERSTON, ROSSHIRE, N.B.

Owing to the extremely high prices for horses at present, a larger number might be reared with profit, and farmers might advantageously rear all the horses they themselves require.

A farm difficult to labour is not so suitable for breeding purposes as a light-land and level farm. Mares in foal are less able for the work, and are apt to be hurt, while young horses cannot safely be yoked so soon as on light land. A piece of marshy ground, growing coarse grass, although unsuitable for feeding purposes, is well adapted for rearing horses. Horses cannot be reared so cheaply on a fine-feeding farm as on light or marshy soils. Light friable soils are more profitably occupied in rearing stock; while the stronger and better soils are more suitable for feeding purposes.

In some quarters sheep, and in others cattle, are more profitable. In this county the higher districts are nearly exclusively stocked with sheep, while the lower and richer districts are mainly stocked with cattle. Cattle would make a poor substitute for sheep in the upper districts, while low-land farmers would be unwilling to give up their cattle for sheep, although the keeping of sheep on high-rented lands is largely increasing.

I have known arable farmers take to sheep and afterwards give them up, supposing themselves better paid with cattle; but I have known far more take to sheep partially along with cattle, and continue the system, believing themselves more largely remunerated by keeping both sheep and cattle. Black-faced sheep suit the more exposed places best; Cheviot or grey-faced pay better in the less-exposed ranges; and half- or three-parts bred are more profitable in the finer soils and warmer climate. Highland cattle suit well where the climate is cold and the exposure great; but on the lower grounds, progeny from a Shorthorn bull and a strong cross-cow is of more rapid growth, and consequently of greater profit. A cross between a Shorthorn bull and a polled cow is hardy, of great growth, and generally suitable. Perhaps the most suitable horses for this quarter are those that are got by a Clydesdale horse and the mares bred in the district. Horses, very high standing or very heavy, are not so well adapted for general agricultural work, especially on hilly farms, as horses that are smaller, if well made, and with shorter legs.

ÆNEAS ADAM.

50. ACTHORPE, LOUTH, LINCOLNSHIRE.

At the present price of stock, the breeding of sheep and cattle could, in many instances, be increased with advantage; but the great loss and disappointment resulting from the prevalence of the foot-and-mouth disease no doubt deter many from increasing as much as they otherwise would do.

Very hilly land and strong clay soils are not suitable for the breeding of agricultural horses, as the mares at some season of the year, when not rearing their foals, ought to work, consequently it does not pay to breed that class of horse under those circumstances, excepting when the general demand for horses makes their value unusually great.

When the grass land belonging to a farm will fatten cattle without artificial food, or when a farm has scarcely any grass land upon it, it will then pay better to buy cattle, to feed in the one case, or to put them in the foldyard in the other. Excepting on the strong feeding-lands, or where some particular spot has been found unhealthy for lambs, a farmer, I think, should always breed, at least, the number of sheep he requires; and if on poor soil, he may find it more profitable to rear only, and not to fatten any himself.

The breeding of agricultural horses in this district, beyond the requirements of the farm, is not, as a rule, more profitable than the rearing or feeding of cattle and sheep. Hacks are not generally of sufficient value to be profitable; and perhaps one or two hunters or carriage-horses only pay when fortunate enough to keep sound. Sheep are usually more profitable than cattle, as they arrive at maturity sooner, and their wool greatly adds to their value.

We have no extensive breeders of horses in this district. I have known owners of stock increase their flocks, but not their herds to the same extent. The shire horses for agricultural purposes are most suitable, and so are Shorthorn cattle and Lincoln sheep; but as the length and lustre of the Lincoln's wool cannot be grown except in a limited area, the value of this breed out of the county is confined to particular districts, except when used for crossing with other flocks, which is often done with success.

HENRY SHARPLEY.

51. MANOR HOUSE, CARPERBY, BEDALE, YORKSHIRE.

I believe that British farmers might with profit to themselves breed more horses, cattle, and sheep than they now do. When the land is of rich quality and in permanent grass, I think it more profitable to buy than breed horses; on most arable farms, and when the grass is of inferior quality for fattening cattle and sheep, I am of opinion that horses may be bred with profit.

When the land is all under the plough, without any permanent grass, I incline to the opinion that it may be more profitable to the farmer to buy than breed cattle; also in some cases where the land, though in permanent grass, is of a very rich fattening character. In some cases the land is unhealthy for young animals. Under these circumstances the purchasing of store cattle might be the more profitable course.

On all lands that are subject to produce the rot in sheep it is more profitable to buy and fatten than breed; but when the land is of a dry sound character, and healthy for them, I believe breeding them is the more profitable plan.

I doubt whether on any lands that are adapted for the successful breeding and rearing of cattle and sheep it would be profitable to rear horses extensively.

Sheep and cattle arrive at earlier maturity than horses. They are not liable to unsoundness as horses are; and although the price of horses is at present high, I doubt whether they yield in the long run so adequate a remuneration as sheep and cattle.

I have known many farmers who have reduced their number of breeding mares, and increased their numbers of cattle and sheep. I know of no farmer who has given up the breeding of cattle and sheep and turned to breeding horses.

I should say the Cleveland breed of horses answers for farming purposes as well as any in this district; next to these the Clydesdale. Shorthorn cattle, and crosses from them, are far a-head of all others. In the valleys and lowlands the Improved Leicester sheep, and on the high grounds the Black-faced Highland, and crosses from them by the Improved Leicester or Long-woolled ram, are best suited.

THOMAS WILLIS, Jun.

52. HOLKER, CARKE-IN-CARTMEL, LANCASHIRE.

If the produce of the land were increased, more stock could be profitably bred.

If the farm is all under tillage, and in a high state of cultivation, no horses should be bred upon it. No farm is adapted for breeding cattle unless there is a fair proportion of permanent pasture and meadow land in it. When the farm is all in grass, and no winter food except hay produced upon it, or when a farm is all good feeding or fattening land, it will answer better to purchase than breed cattle or sheep.

I think cattle- and sheep-breeding are more profitable than horse-breeding. The risk is much less. The bulk of the profit on hunters and carriage-horses goes to the dealer, as gentlemen seldom purchase their horses direct from the farmer. This does not apply so much to cart-horses, and at present they are paying better for breeding than any other description of horse.

During the cattle-plague time the Cheshire farmers stocked the land with sheep in many instances; but I understand they have given up sheep and gone to cattle again. As a rule, all the great breeding-districts for cattle are on the west or wet side of the kingdom, from Ayrshire to Devonshire. The greater portion of the sheep are bred on the east or dry side of the kingdom. The Clydesdale and midland counties horses are both very good, and generally used here. Scarcely any kind of horned cattle are bred but Shorthorns. The breed of sheep depends upon the pasture and the altitude of the farm. Herdwicks are the breed on our mountains, and large Leicesters and Shropshires on the lowlands.

I remember some years ago meeting a farmer from Northumberland, who told me he had bred 8 or 9 foals from one mare, and, although they averaged 80*l.* each, he had given up horse-breeding, as he found sheep pay him better.

No doubt farmers of late years have turned their attention more to cattle and sheep, though at present the high prices are tempting them to breed more horses.

G. DREWRY.

53. CORSKELLIE, BY HUNTLY, N.B.

Farmers could with profit to themselves and advantage to the nation breed more horses, cattle, and sheep. I do not know any agricultural circumstance that would make the purchasing of horses preferable to breeding at present prices; although the cost of rearing would be less on farms having a good outrun and shelter than where the extent under grass is limited. On carse lands, or when the soil and climate are favourable for almost continuous cropping, and when that system is practised, stock must be bought to consume the winter food of the farm if not otherwise disposed of; but when there are two-fifths to one-half or more under grass, breeding all the stock you can fatten is the most profitable, owing to the high price that has now to be paid for good young stock, as well as the difficulty of getting them.

On arable farms suitable for cattle, I would buy sheep to graze, rather than breed them; breeding sheep and fattening them can only be carried out profitably on a large scale, each class of stock having to to be kept separate, which would be expensive and troublesome on a small farm. I do not know that the breeding of horses would be more or less profitable than cattle or sheep, but more money would be made by having all the three classes on the same farm than from either singly.

On rich pasture or first-class grass land cattle will pay better than sheep; while on exposed or steep land of indifferent quality sheep will pay best.

The Clydesdale horse is well suited for any agricultural district; while as to cattle, I do not think that any of our pure breeds will come so early to maturity, or give a better return in meat for the amount of food they consume, than a first cross out of a polled or a Highland cow, and after a Shorthorn bull. It, of all others, is the true rent-payer. Every subsequent cross leaves more weeds, although, with proper selection, you get fewer as you go on.

Of sheep, half-breds are the best. For quality of mutton, Grey-faces (Crosses) may be superior.

A. F. LESLIE.

54. BURTON FIELDS, STAMFORD BRIDGE, YORKSHIRE.

I think the British farmer could with profit breed more cattle than at present. With regard to horses and sheep much depends upon the situation of the farm and the nature of the land. Rich grass will not pay to be eaten up by young horses and sheep. At any rate, in most cases, it will pay better eaten by cattle.

If a farmer has a portion of second-rate grass land, he can with profit breed a few horses; but he must not begin to breed from unsound animals, or else he gets worthless ones, and they eat him up.

Some people take the trouble to breed as many cattle as can be fed on the farm, and I think it is a very good plan and pays well, while there is less risk of diseases of all sorts. Others, on good land, buy cattle and feed them out, and by so doing get a quicker return, but often bring disease, which reduces the profit. I think almost every farmer can breed a certain quantity of sheep with profit.

Horses we must have; but breeding sheep and cattle pays better. There is less risk, and quicker returns are obtained.

I think a good, wide, short-legged horse, with substance, and not too much hair on his legs, 16 hands high, with good action, suits best; and I think every farmer ought to have a nice, wide, bay, coaching mare to work in the farm and breed, so as to keep this class of harness-horses in England. The foreigners purchase many of the best bay mares from Yorkshire.

Shorthorns are the best of the cattle breeds. Leicesters, with as much substance and quality as possible, stand highest among sheep.

JOHN KIRBY.

55. EDINBURGH.

Nothing pays worse than overstocking, so it is doubtful if, as a rule, more stock could be profitably bred.

Where the whole of the land is under tillage, I think one brood-mare to, say, each 300 acres, enough. Breeding is most profitable where there are a number of small fields in permanent pasture. Every farmer who holds twenty acres or upwards might breed horses.

This also holds good as to cattle, I think. I approve of the division of labour, even in stock-breeding. On a rich arable farm the farm-offices should be constructed with a special view to the fattening of as large a number of cattle as is possible.

The buying of lean sheep to fatten and the breeding of sheep may, I think, be practised with success on the same arable farm. On clay soils sheep should not be much kept; still I think the breeding of sheep should only be practised on rich corn land, when the lambs can all be sold off fat, *as lambs*, and the ewes sold off fat also in the autumn. For the breeding of sheep that are to live till they are wethers and ewes, pasture lands and hills are the fittest places.

One large farmer in Yorkshire told me he devoted nearly his whole large farm of 2000 acres to the rearing of carriage-horses fit for the London market. One dealer bought the whole "crop," so to speak, at, I think, 100*l.* each, at four-years-old, without seeing them. In spite of the enormous rise in the value of horses, the inducement to breed is scarcely so great, relatively, as it was. The Shetland Islands in this respect, as in many others, form a sort of miniature picture of Great Britain. Formerly their great product was ponies. These require less keeping than cattle, and run out all the winter. The former price was 3*l.*; now it is 10*l.* to 20*l.* The longer period of gestation, the uncertainty and the risk, turn the scale in favour of improved sheep and cattle. A mare is not nearly so sure of having a foal as a cow or a ewe is of having a calf or a lamb.

In my experience there is very little average profit on feeding cattle. They are necessary evils to make manure. This is becoming more and more the case since imported diseases have become so common; I therefore think sheep more profitable in Scotland than cattle to feed.

I think for all parts of Great Britain and Ireland the two best breeds of horses for the plough are the Clydesdale first, and the Suffolk Punch second. For shallow steep-hill land I would like a dash of *blood* in the breed.

As to cattle I believe the Shorthorn and the Aberdeenshire are far the best, and the two make a splendid cross.

As to sheep it is quite different; no two breeds are fitted for the whole United Kingdom. I found lately (three years ago), on investigation, that the Black-faced was returning into favour in moor-lands. I am not quite sure of the Cotswold, after having bred hundreds of them; I think the Scotch or Border Leicesters better even for the Cotswold country.

R. SCOT-SKIRVING.

56. NARRAGHMORE, ATHY, IRELAND.

I think farmers could breed more stock with profit.

Breeding horses for the farm is, in my opinion, the more preferable plan to purchasing them, for two reasons—first, it is, at present prices, the more profitable; and in the second place, horses bred on the farm are, as a rule, more healthy than those purchased. Where, however, the farm is entirely a tillage one and the soil heavy, farm-horses cannot be either conveniently or so profitably reared. The best soil on which to rear farm or any kind of horses profitably is one which is light in texture, dry, and possessing a fair share of grazing-ground of a rough but grassy nature.

Wherever, as a rule, the farm or soil is unsuitable for grazing it is unsuitable for breeding and rearing. Hence it is found almost to a certainty that the greatest numbers of cattle are produced where the land is found suitable for pasturing and dairying, and the fewest where the soil will not naturally grow grass.

Sheep cannot be bred and reared profitably on heavy undrained land, or on any kind of soil which is wet and in want of drainage. On all light land and dry farms sheep do well; and on such farms, in my opinion, the most natural method is to rear a sufficiency for the farm. Under the reverse conditions it becomes a necessity to purchase sheep for fattening purposes.

Under no circumstances that I am aware of is the breeding and rearing of agricultural or any kind of horse more profitable to the farmer than the breeding and feeding of cattle and sheep.

In my opinion cattle- and sheep-breeders, always supposing that the business is understood and the right breeds cultivated, have fewer risks to encounter—less expensive feeding being required,—and the money-value of the animals can be sooner and more certainly realised than by breeding horses.

I have known of very many instances where men in the habit of breeding horses to a moderate extent have got disgusted with all the extra trouble entailed by it; and in breeding hunters, hacks, &c., especially disgusted with the improper characters of trainers and grooms; and have in consequence abandoned horse- for cattle- and sheep-breeding.

I have never known of a farmer giving up cattle- and sheep-breeding for horse-breeding, unless under very peculiar circumstances, more connected with taste than with profit. In some instances in Ireland I have known farmers give over keeping sheep from the difficulty there often is of getting them properly herded and taken care of. In some instances, too, where the land, from good management, has become too rich for the successful rearing of lambs, I have known cattle substituted.

At present the breeding of half-bred horses (that is an animal between the cart-mare and the thoroughbred sire) pays best in Ireland, and if bred big enough make the best horses for the farm. Shorthorns or their crosses, and Leicester and Lincoln sheep, and their crosses, if properly fed and managed, are the most suitable for this part of Ireland. For the United Kingdom, for farm work, I should say the Clydesdale horse is generally the most suitable. With regard to cattle and sheep, soil and climate must be taken into account, and different breeds kept to suit different circumstances.

THOMAS ROBERTSON.

57. ELLINGHAM, CHATHILL, NORTHUMBERLAND.

With the exception of cart-horses at their present price, I do not think farmers could breed more stock with profit. Young or lean stock are quite as cheap relatively as fat stock are.

On good land, worth upwards of 40s. per acre, breeding horses will not pay, not even cart-horses. On rough grass land, or half moor and half grass, that is, where the rough grass runs into patches of heather here and there, breeding cart-horses will pay well. In no case will breeding hacks and blood-horses pay.

Under no circumstances will breeding horses pay better than other kinds of stock; agricultural horses, at their present price, excepted, that is, on rough grazing land. As a rule, sheep will pay better than cattle; but they take more management, and are very often bungled, and therefore some farmers say they "can get more money out of their cattle." On deep rich pasture land, cattle will answer better; on light pastures, sheep will. If arable land, growing turnips, be so strong that sheep eating the turnips on the land would plunge it so that it would not work well afterwards for seed-corn, then the turnips must be carted off for cattle; or if the land under turnips be so rich and good that, were the turnips eaten-on by sheep, it would grow over heavy a crop of barley, then again the turnips must be carted off for cattle. On other kinds of arable land, sheep will pay the better, keeping out of the question the necessity of having straw made into manure by cattle.

I have known several farmers who have given up horse-breeding because it did not pay. Breeding what are called "*blood-horses*" will not pay. I have bred them myself and have given them up; and I know one or two farmers who have bred them for thirty years, and have also given them up. I can safely say that they would have now been 5000*l.* richer had they never bred blood-horses, though they were considered to have bred them with more than ordinary success. We are indebted to the following causes for even the supply of bad blood-horses that we have. Many farmers have a hobby to see a colt or two running about their farms, and therefore breed them; others have an old or lame mare and breed from her, because they do not know what else to do with her. "Oh! I cannot be much out of pocket by having a single brood-mare," they will tell you. But lately, since beef and mutton have got so dear, they do "*begrudge*" even the old brood-mare her meat, and prefer making it into beef and mutton. Again, a farmer who breeds blood-horses cannot put them into money when he wishes. He may have a nice, say five-years-old horse, that is really worth in the market 150*l.*, but still he finds he cannot get the price for him when he wants, and for three, six, and even twelve months, the horse has to be kept on hand before he can be sold; and then very often there is a misunderstanding about his soundness, &c. All this annoys and disgusts a farmer with the breeding of horses. Still a hobby to have the article goes a long way; and it is more this hobby than the chance of profit that is the cause of farmers breeding blood-horses.

In former times persons who principally made use of blood-horses, such as masters of hounds, cab-proprietors, &c., could buy them at little more than two-thirds of the cost it took to produce them. Now they have got dearer; and though they will yet scarcely fetch the full extent of their cost, we hear a great deal of the scarcity and dearness of horses, because they are valued from the stand-point of price that they used to be formerly, which was much too cheap. They are still cheaper than beef and mutton to the purchaser.

In breeding blood-horses, two causes act partly against each other. Firstly, a breeder tries to have them handsome and good-looking, and for this purpose he would put a handsome and good-looking mare to a handsome and good-looking horse. But then there is a second consideration comes in the way: that handsome and good-looking horse may have run last for the St. Leger, and the winner, who may neither be handsome nor good-looking, would very likely be preferred for a sire, simply because he had been a good performer; and for some reasons it would be quite right that he should be, though for other reasons it might be quite wrong. The class of horses in which hunters and carriage-horses may be placed, is bred entirely on a wrong principle, or rather without any principle at all. Neither the care, nor the judgment, nor the experience is brought to bear on their production that is used in the breeding of other kinds of good farm-stock. Take, for instance, Shorthorn cattle or Leicester sheep; no end of trouble is taken to produce the kind that is required: one type of animal is tried on another, and this strain of blood on that, and notes are taken how they answer or do not answer, until by experience the breeder can go to work in somewhat of a systematic way to obtain what he wants. In breeding horses there is nothing of all this, everything is done at random.

With regard to sheep and cattle, a part of both do best on a farm usually, for this reason: sheep are fond of particular kinds of grasses and plants; they eat these, and leave the kinds they do not like; and the former by degrees, by being constantly eaten down, are overrun by those kinds that sheep do not like, and die out. The pasture then becomes bad for sheep; the same may be said of cattle, to a less extent. An ordinary grass field, therefore, is better grazed with cattle one part of the year, and with sheep another. Both going in the same field together is bad for the cattle; the sheep eat the finer grass, and the cattle do badly.

The "Coquet-side" cart-horse is lighter rather than the Clydesdale, but has far more action than any other breed of cart-horse that I know of. Border Leicester, Cheviots, and Black-faced sheep, and the breeds between these, are common here. Half Border Leicester and half Cheviot are now coming very much in fashion.

THOMAS FORSTER, JUN.

58. CRUIVIE, FIFE.

I think farmers might breed more horses, cattle, and sheep, with profit to themselves.

On the better class of soils, cultivated on a regular rotation of cropping, and not thoroughly fenced, it is preferable to purchase horses rather than breed them. On the other hand, it is preferable to breed horses on grassy deep land, where it is well fenced. The best districts for breeding and rearing horses are those generally in a secondary climate, with deep grassy soils, which are not so valuable for growing grain and green crops.

On the best class of farms, where a large extent of grain and potatoes are grown in regular rotation of cropping, and in a dry early climate, without permanent pasture, it is better to purchase store-cattle for feeding than breed the whole, as generally more cattle are required to consume the turnip-crop than can be grazed through the summer. It is more profitable to use artificial feeding-stuffs on fattening cattle than on breeding or keeping stock.

I have no experience of hacks or hunters. On strictly arable land it is better to breed and feed cattle and sheep than horses; but I would combine the breeding and rearing a few agricultural horses wherever the holding is suitable for grazing them.

I consider the rearing and feeding of cattle and sheep combined the best. Sheep are better than cattle on thin dry soils, especially where it is also steep. Cattle are better than sheep on heavy strongish soils, and especially where there is old rich grass. I have not known any farmer breed horses extensively in this county. Clydesdale horses, Shorthorn cattle, or good crosses of that breed—Leicester, Cheviot, and Shropshire Down sheep, or crosses of these breeds—are most suitable for this part of the country.

ALEXANDER REID.

59. COULARD BANK, LOSSIEMOUTH, ELGIN, N.B.

I think that, were British farmers guaranteed compensation at the end of their tenancies for value of unexhausted manures and feeding-stuffs, they could and would, with profit to themselves, breed and feed more stock than they do, more especially for some years at the end and also at the beginning of their leases.

Proximity to large towns, and unenclosed badly sheltered-farms, make buying of horses preferable to breeding. On enclosed suitable breeding-farms, horses reared generally do better than those bought-in, and they seem to be less liable to disease; they are generally more carefully handled when young, if they are to be retained and worked on the farm.

On certain farms, generally the heavier lands, and where the water is bad, breeding-cattle do not thrive. The cows are more liable to cast calf, and to come irregularly to the bull. Young cattle are also more liable to diseases of several kinds, and the percentage of deaths is much greater. On such farms it is more profitable to buy six-quarter or two-year-olds for feeding, than to attempt to rear them. The same remarks apply to sheep, while the size of the holding has also something to do with the question. If a man has to be kept to look after a small lot of ewes, and another to look after a small lot of feeding-sheep, the expense would be too great, and it would then in all likelihood be more profitable either to keep a breeding- or feeding-flock, according to the nature of the farm.

I think the circumstances very rare in which the breeding and rearing of horses is more profitable than the breeding and feeding of cattle and sheep. Sheep are more profitable than cattle to the British farmer on dry, light soils. They can be managed at less expense, are less liable to destructive diseases, make as much or more weight of flesh for the food consumed, and the wool besides.

I consider Clydesdale horses; Shorthorn cattle, and crosses of these with Black-polled; and crosses of the Leicester with Cheviot and Black-faced sheep, the most suitable for this part of the country.

THOS. YOOL.

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60. WHITE HALL, GRAYS, ESSEX.

There can be no doubt that British farmers could profitably breed more horses, cattle, and sheep than they do, except in very early districts, where market-gardening is practised extensively, and the value of land thereby so greatly increased, that the breeding of any kind of stock would not prove remunerative.

The buying of store-cattle and sheep in preference to breeding is practised in those districts where pasture is naturally rich, and capable of fattening without the aid of artificial foods.

The upland pastoral districts seem peculiarly adapted for the breeding and rearing of young stock of all kinds; and though they might also be fed-off there, the outlay necessary for other foods would leave no margin for profit. Again, the buying of lean sheep is generally the practice in our southern early climates, where usually two crops are grown. The second crop, for the most part consisting of roots and rape, being fed-off, will usually pay well in meat alone, whilst the land is enriched and brought into excellent condition for succeeding corn crops. This system of farming is widely adopted as being more remunerative than the rearing of stock, even with the exceptionally high prices of stores.

Shorthorn cattle and Down sheep are best suited for this district, their fattening properties and early maturity giving them precedence over any other kind; and perhaps no class of horses are found more generally serviceable than the Suffolk breed—they are hardy, docile, and durable. The farm-horses in this district are not generally of a pure breed, but the Suffolk is gaining in favour.

A. Neilson.

61. Castle Crawford, Abington, Lanarkshire.

Where the soil is light, horse-breeding cannot be carried on as a rule with profit; but where the soil is stronger and good for grass, it is usually profitable to breed horses. They can be bred as high as 1000 feet above the sea-level; but, as a rule, beyond 700 or 800 feet it is more profitable to rear cattle and sheep than to breed horses or grow grain. The counties of Lanark, Renfrew, Dumbarton, and the Falkirk district, are the best suited in Scotland for horse-breeding, having a moist climate and good grazing land. In these localities, even with more moderate prices than are now obtainable, horse-breeding would pay better than sheep on the low grounds, as the moist climate, and damp grassy lands, often cause loss by foot-rot and lameness in sheep.

The Clydesdale is the best horse, but a very good, hardy, useful animal is the common Cumberland horse.

If the land generally were better farmed, more stock could be kept, but that would require more capital. In high districts, cattle and sheep require a great deal of artificial feeding-stuffs to fatten them speedily off, which eats up a great deal of the profit. I have had good three-year-old black-faced wethers feeding on turnips—over 40 tons weight per acre—here at a height of 900 feet above the sea, and the animals left nothing for the turnips; the cost of the cake, &c., consumed being equal to the difference between the lean and the fat prices of the wethers.

Sheep have been fully as profitable stock as cattle for some years, especially on the lighter soils. One thing operating against cattle-breeding and dairying is the difficulty of getting good female servants to attend properly to the cows.

I have tried Shorthorns here, but they had to be kept on expensive food in the house. Ayrshires are the best breed for the south-west of Scotland. Of sheep, I prefer the Border Leicester for the low lands and for crossing, the Cheviot for the better class of hill-grazings, and the Black-faced for the higher ranges.

David Tweedie.

62. Castletown, Athy, Ireland.

The portion of Queen's County with which I am best acquainted, containing, say, 100 square miles, was, even within my recollection, mainly devoted to dairy-farming. I remember it since about 1840. Wheat was then extensively grown in many places. There were not perhaps more than 100 acres of turnip or other green crop to be seen in the entire district; and fully one-fourth of the wheat was then sown on naked fallow, the remaining three-fourths following potatoes. At present we have very little tillage, and barley is the principal corn crop.

The large dairies are all given up now, except in the mountain district. What we term mountains are mere hills, ranging from 500 to 900 feet above the sea-level. Nearly all the better class land is at present held by graziers. The store sheep or cattle are bred outside of the district—chiefly in Tipperary and

Limerick—and are bought-in from May to November. Stock purchased at this time of year are wintered out, and will be sold fat by November 1876.

There is only one thoroughbred stallion in the district. I doubt if there be even one pure-bred Clydesdale stallion, but there are three or four half-bred draught stallions. Those who breed hacks and hunters send their mares to the Curragh of Kildare, which is only 20 miles distant; and, during the season, some half-bred travelling stallions pass regularly through.

We sell a great number of hunters and harness-horses, but I do not think that any one farmer makes a business of horse-breeding. It is found that it does not pay.

P. Cahill.

63. Maulden, Ampthill, Bedfordshire.

I think more horses, cattle, sheep, and pigs might be bred profitably.

I have come to the conclusion that it answers my purpose best to breed the whole of the stock required on my farm.

By securing a good sort to start with, you may breed better animals than you can buy, and are much less liable to disease than where fresh stock is constantly being purchased.

I usually put about half-a-dozen mares to the best horses in the neighbourhood, such as Stokes's "Young Champion," or his brother, Manning's (now Statter's) "Young Champion."

The mares are worked nearly up to the time of foaling, and again for light work soon after, so that but little time is lost.

I have four foals this year worth from 30*l.* to 40*l.* each.

I do not think it answers to keep mares for breeding only, but where they work on the farm it is profitable.

On heavy hardworking-land there would be danger of the mares casting their foals through drawing too hard.

On rich pasture-land I think it answers better to buy old beasts which will quickly fatten than to breed.

Lambs seldom do well on rich pasture, hence it is better to buy.

On ordinary arable farms, with a fair proportion of grass, I think it better to breed all kinds of stock required for the farm. I consider sheep to be the most profitable.

Oxfordshire Downs are most suitable to this neighbourhood. They come to early maturity, of great weight, good quality, and cut good fleeces. One of my tegs, on the 1st of April, cut 16½ lbs., and an ewe teg, 15½ lbs.

George Street.

64. Kirkton, Inverness, N.B.

I consider that if more judicious and careful attention were bestowed on the breeding of cattle and horses in the northern counties of Scotland, not a single horn or hoof need cross the Grampians for the purposes of feeding or yoking. Many farms in the north are excellently adapted for breeding cattle, and would pay better thus employed; but fancy leads the occupiers to adopt, as they think, less risky systems of farming, such as buying Irish or English stores for wintering, buying sheep for feeding, or letting the green crop to the sheep-farmers. By the latter course, large prices may be obtained for turnips; but there is usually a considerable waste in the stackyard, which would be obviated by the farmer having in his possession a lot of good young cattle. The light loamy soils in the north are very suitable for the breeding of cattle, while the heavier carse-lands are better adapted for feeding. On the latter the cattle usually feed rapidly; but a breeding-stock is apt to get too fat, with cows missing calf; and in some instances even the calves and stirks reared on such soils are subject to black-leg. On such holdings, therefore, buying stores is preferable to breeding, but there are few cases of this kind in the north. On light land, awkwardly situated for working, sheep-feeding pays best. Breeding of ordinary sheep stocks will not pay the highly rented arable farmer.

Horses bred on the farm are much more durable and healthy than those bought-in; therefore, every farmer should endeavour to breed his own horse-supply, which, with care and attention, in this part of the country can be generally done profitably.

JOHN CRAN.

65. BLAIRTON, ABERDEEN.

Grain farms, where there is not much pasture-grass, or farms near large cities, are unsuited for breeding horses. In such cases purchasing is, as a rule, preferable to breeding. On grass farms a fair proportion of horse-breeding should pay.

Some farms are better for feeding than breeding cattle. As a rule, fine soils, where grass and turnips are of fine quality, should be used for feeding; and poorer soils largely devoted to breeding. Of course, shelter, climate, altitude, &c., have to be studied. Should beef and mutton maintain present prices, the British farmer should lay more of his land in grass. It will be especially to his profit to do so, taking into account the present price of labour and manures. In this case more cattle and sheep would be required.

Were the present extreme prices to continue, neither cattle nor sheep would pay the farmer so well as the rearing of horses; but at ordinary prices I know of no circumstance where it would be prudent to drop the keeping of cattle and sheep, and breed horses only. We must bear in mind that after having a mare served it is five years before her progeny is properly fit for work; and my experience is that great changes of price often take place in shorter time. Breeding part is the safer way.

On arable farms of good soil in all our low-lying districts I reckon cattle (with perhaps a few sheep to eat up foggage, &c.) the most profitable; as you approach the higher lands or thin soils you require to increase your sheep.

We have no very distinct breed of horses in this district. Our cart-horses, I should say, are a sort of mixture of all breeds. Our roadsters are a little more distinct, but we have no clearly marked line of distinction. We just endeavour to get a good stallion, and cross away. As to cattle, where climate and soil are good, the Shorthorns will come earlier to maturity, and give more weight for their keep than any other breed we have; but they are more delicate, and require more attention and shelter in bad weather. I reckon the Aberdeenshire breed a valuable one. The West Highland cattle, I have no doubt, are well suited for their own district.

ALEX. CAMPBELL.

66. THE MANOR HOUSE, CATTERICK, YORKSHIRE.

I have no hesitation in saying that farmers could breed more stock profitably. I should say, all farmers ought to breed their own horses if possible (that is, working farm-horses), and this can be done to advantage on most farms. I am not aware of any circumstances that make buying cattle or sheep more profitable than breeding.

It is my opinion that a farmer ought to breed as much as possible. On my farm I breed everything I require except hunters. These I buy when nearly fit for use. In my opinion, if more farmers would pay attention to the selection of their breeding-stock it would be to their own advantage, and we should, by degrees, see the markets and fairs cleared of a number of rubbish which are continually offered as grazing-stock.

Breeding of horses, in preference to cattle and sheep, can be carried on to advantage where the breeder is a good judge, a good horseman, and has buildings, paddocks, &c., adapted for the purpose; but, as I said before, any farmer can keep a good draught brood-mare to work, and breed a foal annually; the breeding of hunters, hacks, &c., however, is always attended by more risk than cattle-breeding, still the prizes to be won are very tempting. For instance, I know a tenant-farmer this year who realised over 600*l.* for a 3-year-old hunting colt, and I have a 2-year-old colt I gave 367*l.* 10*s.* for. These, of course, are extreme cases; but I know many farmers who have made money by keeping a good half-bred brood-mare, and have had the sense to send to a fashionable good sire. I know many who have lost money by breeding from some outcast that could not be sold, and patronising the horse that would take the mare for the smallest fee.

I should say that where the farm is adapted for sheep nothing pays so well. Clydesdale horses, Shorthorn cattle, and Leicester sheep, are the best farmers' breeds.

T. H. HUTCHINSON.

67. MERRYTON, HAMILTON, N.B.

My opinion is that, considering the present high rate of wages, and low price of wheat, it would be an advantage to the farmer to give more attention to the rearing of live-stock, particularly draught-horses, which command a high price when sold, and are usually healthy and work best on the farm where they are bred. My experience is that no class of stock breeds so true as the Clydesdale, which differs in this respect from Ayrshire cattle and Border Leicester sheep. Both of these I have tried. The former I retain, but the latter I gave up as unsuitable for the moist climate of this district. Draught mares are all the better for being moderately worked till the day they foal; and should they not prove in foal, the only loss is the service of the horse, and this is more than can be said of any other breed. I think draught-stallions serve too many mares, about 100 being the usual number. Were the number restricted to 60, I believe there would be more foals, and the horse would continue longer serviceable. Landlords have it in their power to do much for the improvement of the breed of draught-horses, by aiding their tenantry in securing good stallions.

LAWRENCE DREW.

68. PRESTON FARM, DUNSE, N.B.

Farmers could profitably breed more stock, because the demand for both fat and unfed stock, as well as for horses, is great, and seems likely to continue good; also in view of the extensive and apparently-increasing competition in the British grain-market, by imports from nearly every quarter of the globe.

Upon mixed arable farms, where part of the acreage is in permanent pasture of second-rate quality, and especially where such is undulating, horses can be profitably bred. The cost of rearing a few foals is inconsiderable, and thus the necessary horse-supply may be kept up in an inexpensive manner. When horses are bred upon the farm, they can be more profitably worked and with less risk when first put into the yoke. Young bought-in horses almost invariably do not thrive until they have been upon the farm for some time, and have become thoroughly accustomed to it.

Upon mixed arable farms, where a large acreage of turnips and swedes is cultivated, it is certainly the most profitable course to buy yearling stirks late in the autumn, winter these either upon rape-cake and straw, or upon roots and straw, graze them in the following summer, and fatten them in the winter. In our district it is not so remunerative to rear calves, for the land is too valuable, and the cost of maintaining and rearing calves too great as compared with the remuneration. The general character of cows in our district is too mixed for breeding fattening cattle, and the cost of maintaining a good Shorthorn stock would be too great.

On high-rented arable farms, as in East Lothian, where comparatively little land is in grass, and all the land of good quality, it is most profitable not to breed what the holding can fatten, but to buy them in for this purpose; but upon mixed arable farms, where there is a variety of soil and some permanent pasture, it is the most profitable course to breed what the holding can fatten. Thus, also, the risk of introducing infectious and parasitic diseases among the sheep stock on the farm, is considerably diminished.

Sheep are the more profitable upon farms of medium and lighter character, because they manure the land more evenly and at less expense. Cartage and other expenses are considerably reduced. Sheep, on the whole, are also more remunerative. But upon heavy clay farms, where sheep cannot be easily fattened upon the land without injuring the mechanical condition of the soil for the succeeding grain-crops, cattle would certainly be the more profitable.

The most profitable farm-horse, generally speaking, is the pure-bred Clydesdale, but a cross between the Clydesdale and Cleveland forms a very useful breed of horses upon the lighter farms of our district.

The best breeds are pure-bred Shorthorn cattle and pure-bred Border Leicester sheep; but upon the more elevated farms in our district, a second cross of the Cheviot ewe, with a pure-bred Border Leicester ram forms a very hardy and useful sheep.

GEORGE P. SMITH.

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69. DIPPLE, FOCHABERS, MORAYSHIRE, N.B.

I am of opinion that it is quite impossible to breed horses other than agricultural with profit in this county. One reason is that the soil is too hard and stony for the animals' feet, and being of a very fattening nature, adds materially to the danger, as the animal frequently carries more weight of carcase than the legs can support. The soil, combined with our fine climate, tells considerably in favour of producing beef and mutton as against horse-breeding. Another reason is the want of suitable stallions to put to mares which might otherwise leave a good foal, but, in common reason, cannot be expected to leave a sound one when the sire is only relegated to the duty of serving mares when he is too unsound for any other purpose. I am strongly of opinion that in breeding horses, as well as all other kinds of stock, we should have at least a pure-bred sire, and he a sound one; and that no mongrel can, generally speaking, produce stock that will be profitable to the breeder. I think every farmer with ordinary facilities ought to breed the horses necessary for his own farm, if only for the simple reason that horses bred on a farm are invariably less liable to ailments, such as inflammation, colics, &c., than horses bought-in.

Another great obstacle in the way of breeding horses profitably—but I daresay it applies to Scotland more than England or Ireland—is the extent of wire fencing; a great number of accidents constantly occur from this alone, rendering many animals quite unsound and unfit for any purpose but the knacker. It will not pay to breed unsound horses of any kind, much less to rear them.

To make breeding practicable and profitable I think a large arable farm with a good outrun of old pasture and good house accommodation necessary. Upon such a farm a stud of good sound mares and a pure-bred Clydesdale stallion could be kept with profit. The mares, while not rearing their foals, could do the work of the arable land with benefit to themselves, being much less liable to accidents in foaling when kept constantly and carefully at light work till they drop their foals than when allowed to stand idle. I believe a horse standing in his own stable with the mares brought to him would leave three foals for one, compared with the more common way of making the horse travel about the country.

On farms of uniformly good or first-class land (with the exception of eating the foggage and turnips) I do not think it would pay to keep sheep, as to do so with anything like a chance of success, you must have clean pastures naturally dry. On the majority of the farms in this county I think it would be profitable to breed sheep as well as cattle; but in no case unless there is work for a shepherd, as sheep require constant attention, and that by one who understands them. An idea has long prevailed in this part of the country that sheep and cattle will not do together, but I do not think I have ever been better paid than by having part of both; and I see the custom is now becoming general of having some cattle going with the sheep, and *vice versâ*. Sheep require much more attention than cattle, being more subject to diseases of various and many kinds which do not affect cattle. To make sheep pay better than cattle on arable lands you must have the soil and climate both naturally dry and warm.

Some farms, from their richness of condition, are not adapted for breeding cattle or sheep, and on such, buying stores would be more profitable than breeding. Some of our large farmers, with their land in very high condition, have given up breeding almost entirely, finding it preferable to buy from those who, having farms better adapted for that purpose, can do so at a less cost. There is doubtless much less risk than in breeding, especially since foot-and-mouth disease has taken such a hold of the country, which, frequently causing cows to slip their calves and be fed for the butcher, makes a big hole in the profits of a breeding-farm. You could not breed the required number of fattening sheep on a farm without a large outrun for the ewes, as the land would get so foul that it would cause great loss.

JOHN HUNTER.

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70. CAPTON, WILLITON, TAUNTON.

On a large number of farms I believe more stock might be bred with profit.

On farms situated in rich vales, or where holdings consist chiefly of rich arable land with large enclosures, it may not be so profitable to breed horses as to buy. Horses may be bred with profit on poorer or middle-class farms where there is much pasture or grass land with convenient enclosures, or on dairy farms to feed after the cows eating up the rough grass left.

There are many farms where the land is so strong that young cattle cannot be bred with profit, which makes it necessary to buy older animals to fatten.

Some farms are naturally rich in grass land and arable produce, and are by far more suitable to fatten than breed; for instance, farms in rich vales, well sheltered, are adapted for feeding. On these farms large numbers of sheep may be bought and fattened on roots during the winter, and early vetches and young seeds in the spring, and sold before the hot weather sets in.

I consider sheep most profitable as a rule, especially in large arable districts where quantities of roots, &c., can be grown and fed off on the land. Also on all light and Down lands.

Medium-sized cart-horses, with sound good legs, and hacks of the cob description, with plenty of muscle are best for our hilly roads and general purposes.

The Devon cattle I consider the most profitable for this part of the country, as they are hardy and quick to fatten. You can keep three of these on the same land as easily as two Shorthorns, and do better. They are good milkers on the whole; the steers are usually fattened off at three years old; weight from 100 to 125 stones, of 8 lbs. The Devon Long-wool sheep are the most profitable; they carry heavy rich fleeces of the finest wool, and possess all the fattening qualities of the Leicester, and larger size with more flesh, come earlier to maturity, and are much hardier.

On many farms wethers are fattened on roots during the winter, and sold off in the spring, when only 13 and 14 months old, from 11 to 12 stone each. They will cut from 8½ to 10 lbs. clean-washed wool each, and this after having been shorn the previous summer, when lambs, cutting 3 lbs. washed-wool then. On higher and colder farms the Devon Long-wools are often used for a cross with Mountain Horns, making a very hardy and profitable sort. They are also often used to cross other kinds of sheep for improvement, and much used with the Down ewe for fattening lambs.

The Somerset and Dorset Horned sheep are kept in some parts of Somerset. Where farmers are in the habit of folding their arable land by night, these sheep are mostly used for that purpose.

In some few cases the pure Shorthorn is kept, and also the cross between the Devon and Shorthorn.

A. Bowerman.

71. MAINS OF AIRIES, GALLOWAY.

I think British farmers could breed 50 per cent. more stock in the shape of horses, cattle, and sheep with profit, providing all the farms in the country had the same labour and capital expended upon them as the best-farmed land in this district; but unless the tenant-farmer has some security for unexhausted improvements, stock and crop will not increase to the maximum. Most of the tenant-farmers are beginning to see that the better they farm, the more houses they build, the more land they drain, and lastly, but not the least, the more lime, bones, cake, and corn they consume on the land, in nine cases out of ten, it takes the shape of an extra rise of rent at the end of the lease, just when the tenant is commencing to be paid for his enormous outlay.

I am of opinion it will pay any farmer to breed his own horse-supply at the present high price of horses; but breeding is generally found a disadvantage where cartage is heavy, and especially since reaping-machines have come to be used on every farm. At that time of the year the brood-mare is very easily injured; so with loss of cartage and risk of mare, a number of farmers prefer purchasing their horses to breeding them, which, in my opinion, has caused horses to rise to such a high rate. On a farm partly arable, and the cartage not so heavy, breeding is followed more generally.

On a farm better adapted for crop than grass, it will pay better to buy store cattle than to breed them.

It is more profitable to buy lean sheep where your pasture is better suited for cattle, if you require sheep to feed-off your surplus turnips.

In my opinion, the breeding of cattle and sheep is more profitable to the farmer than that of horses, as there is more consumption for cattle and sheep, which are not so liable to come down in price. If farmers were to change from cattle and sheep to horses, they would fill the country in half-a-dozen years, and, instead of getting 100*l.* for a good horse, we should only be getting 20*l.*

Where the land is either naturally rich or in high manurial condition, cattle will pay best; and on a light soil not well adapted for white crops, I think sheep will pay fully as well; however, the farmer, in every instance, has not his choice, as, for the want of proper house accommodation, he has to keep sheep on land that would pay better with cattle.

In my opinion, the Clydesdale horse for working, the Ayrshire cow for milking, the Shorthorn cattle and half-bred sheep and crosses for feeding, on the arable land; and, of course, on moorland, Black-faced sheep are most suitable in this district.

JAMES LOCKHART.

72. MILMAIN, WIGTOWNSHIRE.

Regarding my experience of sheep and cattle, I was forced into the change two years since, by my dairy-stock taking pleuro-pneumonia. By order of the local authority of this district, my whole dairy-stock was slaughtered, and I was obliged to go in for Cheviot ewes. I crossed them with Long-woolled rams, and had a very good cross. I fed both ewes and lambs fat with turnips and grain through the winter. I consider I got good prices for them, as they were well fed; but on summing up, after having sold out, I find I was a full third short of what my dairy had produced for years before. Being afraid to go into the dairy for another year, I followed the same course last season, and my experience is much the same as above. I have now put on a stock of cows and queys, and intend going into my former system of dairying, as I find this part of the country is better adapted for dairy cows than sheep.

JOHN RALSTON.

73. CHAPEL BANK, PERTHSHIRE.

By all means rear your horses, unless the farm be of clay or heavy soil. You know how they are come, and the high prices we have to pay for good horses render breeding almost a necessity.

In no circumstances, were better accommodation given to farmers in the way of comfortable houses for all ages of cattle, would it be better to buy than breed.

Sheep will thrive and pay where cattle can scarcely exist.

In this locality the breeding and rearing of Clydesdale horses is attended with success and profit. If the breeder, with an ordinary useful strong-legged mare, free from all hereditary disposition of side-bone, spavin, &c., &c., would select a well-bred Clydesdale stallion, he, at present prices, would be sure to breed to profit.

Some enterprising farmers in this neighbourhood breed Shorthorn cattle to fair advantage; but the time it takes to make one famous as such, connected with the outlay for the best blood, &c., altogether runs away with the chance of (in an ordinary lifetime), reaping the full advantage of the expense. The largest quantity and the best quality of beef is, in my opinion, produced by a good cross bullock or heifer. But be sure always to cross with a pure-bred bull.

The breeding of pure Leicester sheep, also, in many instances, pays very well. Only, I have the same objection to it as to cattle. I think the surest source of early remuneration is in the cross, half- or three-part-bred sheep. The first cross between a Black-faced ewe and Leicester ram you always find a good profitable sheep. The mutton of such, in most cases, gives 1*d.* per lb. more than bred or half-bred. For early fat lambs a cross by the Shropshire or Down ram is best.

ROBERT GARDINER.

74. TIRYDAIL, CROSS INN, CARMARTHENSHIRE.

More live stock could be bred profitably, especially at present prices.

The breeding of horses is in some cases prevented by bad fences and steep lands. In general, every farmer should rear horses for his own use, and a few for sale where the land is suitable.

Some farms are very liable to disease—viz., bad lungs, black-leg, &c.—and some lands are more suitable for corn growing. On these it is better to buy cattle for feeding than breed them.

You cannot breed sheep with safety except on dry, sound land. I know of no circumstances that make horse-breeding more profitable than cattle and sheep breeding and rearing.

On the whole, I should say cattle pay best, but some districts are eminently adapted for sheep.

Almost in every instance where a person has taken to extensive horse-breeding, he has given up the practice and turned to sheep or cattle. When at all practicable, it is well to have all the spokes in the wheel; to have horses, cattle, and sheep reared on the same farm.

A good cart-horse of any breed is suitable in this part of the country.

Durham cattle for all good ground; Hereford, or Blacks, for poorer soils; Shropshire Downs for all enclosed lands; Radnors for mountains, are the favourite varieties.

JOHN BRODIE.

75. BEDFORD.

Farmers could, with profit to themselves, breed more horses, cattle, and sheep by increasing the productive power of the land.

The profitable breeding of horses on the farm is best attained on farms having a free range of natural pasture for summer and winter. With a portion of old turf for a run through the winter day, no animal requires less supplementary food. In some parts of England colts are left out through the entire winter, only having a little hay in the most severe weather. Notably this is the case in the rich vale of Aylesbury, and the plan is alike suitable and inexpensive. One great obstacle to the increase of production in this class of stock has been, and is still, the many risks that are run. The pastoral districts make the breeding of horses an institution, and supply the tillage-farmer on cheaper terms than he can rear them for himself—else it may be assumed he would do so.

The breeding of cattle is preferable to purchasing stores for fattening for the butcher; and taking it all in all, it is alike the most profitable and most natural. I give the sales of cattle and sheep bred on a large farm in one of the midland counties, upon rather a strong land, that rents at 2*l.* an acre. About one half of the land is in permanent pasture, and some of the best fields fatten a bullock on each acre. The cattle are all bred by the owner, and sold fat at the age of 2¼ years on the average. They are a profit-making breed, without any pretensions to pedigree Shorthorns, and the average price they have made for some years is 24*l.* 10*s.*

All the calves are hand-fed, and for the first ten days they are served with two quarts of milk a day; then skim-milk and linseed-gruel till they are three months old. Say that the value of the calf, or cost, is 50*s.*, keep for three months, 45*s.*; in all, 4*l.* 15*s.*, at three months old. Then there remains 19*l.* 15*s.* as the payment for 24 months' keep—at the rate of 16*s.* 8*d.* per calendar month.

Again, on the same farm, the sheep are likewise bred, and fattened off at 14 months on the average (being the months of April and March). The average price obtained is 61*s.*, which is a payment of 4*s.* 4*d.* per month, being an equivalent of four to one cattle beast (if the first cost of the lamb is not reckoned).

On the farm referred to, the stock are pastured in the field for five months, and for the remaining seven months of the year they are fed on roots and fodder. I have assumed the value of the calf at three months old to be 4*l.* 15*s.* Then let 2*l.* 10*s.* be allowed for the first summer grazing, and 10 tons of roots for the winter—5*l.* (say, half-acre). Next summer, 3*l.* may be put down for grass, and 9*l.* 5*s.* for roots, and you have the sum of 19*l.* 15*s.*—the actual amount obtained on the average for the stock referred to. No value is put on the straw or hay consumed, as their cost is met by the dung obtained. So, also, about 30*s.* worth of cake is used, which recoups itself in the extra quality of the manure. I have not, indeed, allowed for risk, interest on capital, and labour; but the returns shown are *bonâ fide*, and the farmer is obtaining a good margin of profit annually. The several items given have been submitted to his inspection, and quite accord with his views.

One very important element, as between buying and breeding, is the general judgment and business qualities of the farmer and stock-master; for it is a fact, whatever way it may be explained, that many tillage-farmers never acquire the requisite skill for making the purchasing so profitable as it might be. Hence we find that men—dealers and jobbers, having skill and prudence—have in many cases enriched themselves at the expense of those who are not adepts in the business.

On all dry, gravelly, and sharp lands, sheep are the most profitable, not only as paying more for the given keep, but also as enriching the ground much more. About twenty to twenty-five years ago, when sheep were taken more to in the Howe of the Mearns (Kincardineshire), the land depastured with them yielded an extra increase of about 12 bushels an acre when ploughed for corn crops.

There is little mountain-ground in Bedfordshire, and yet there are six sheep for one cattle-beast; so that every farmer rears and breeds, with little exception, a considerable number of sheep. The Oxford Down is the favourite breed on the best land, and on cold lands farmers prefer Long-wools—most commonly, Cotswolds.

On poor clay-soils they are decidedly preferable to cattle, as they can be fattened on pastures that would not fatten cattle. My experience was the same on gravelly land in Forfarshire, and on my own trap-soils in Renfrewshire. Rather singularly, on the poor gravels at the former place, I went into breeding pure Leicesters, and, owing to their becoming too fat for breeding, the experiment was a complete failure.

The Suffolk is the common horse for plough and cart in Bedfordshire.

DAVID ROBIE.

SUMMARY.

A few of the gentlemen who took the trouble to answer the queries stipulated that their names should not appear in the Reports. Consequently their replies are not printed among the rest, and I need not quote from them in the summing up, as without the names the opinions have little value. Most of the correspondents use such expressions as "I am of opinion," "I believe," and "I think;" therefore it should be understood that their opinions, &c., are founded on their personal experience and observation. Summarising the evidence, and giving also my own views and experience, I begin with

Horses.—Not the least interesting and instructive feature of the foregoing Reports is the reference to the breeding and rearing of horses. On no point of the inquiry do the reporters speak so emphatically as on that relating to hunting-, carriage-, or saddle-horses. All the gentlemen who have given their experience, and many more to whom I have spoken on the subject, agree that the breeding and rearing of horses, other than purely agricultural, cannot be carried on by ordinary farmers with profit. This fact in itself is weighty testimony in favour of Lord Calthorpe's scheme, which, however, appears to have up-hill work. It will be seen by the reports of Messrs. John B. Booth, Finlay Dun, Thos. Forster, T. H. Hutchinson, G. A. Gray, and others who are well qualified to speak authoritatively, that instead of the rearing of field-horses being a profitable business for the British farmer, it has hitherto been a losing game, and many have given it up; hence, no doubt, the growing scarcity and cost of such horses. At first sight one would think that the extraordinary prices paid for good thoroughbred hunting- and carriage-horses should pay the breeder and rearer handsomely. Not so, however. This sort of stock is not only the most risky usually on the farm, but the animals are long in coming into the market, and so afford a slow as well as often a meagre return for the capital, keep, and labour involved. Moreover, young horses, especially of this stamp, are troublesome to other stock in the parks, and are frequently mischievous to young trees and fences, while their sharp hoofs and restless habits are apt to injure the grassy surface. Nor as manure-makers are they good. Again, as Mr. Drewry and some others truly observe, the dealer or trainer has the largest share of the profit, the breeder and rearer generally getting but a moderate figure for the fairly grown, but, it may be, unbroken animal.

A quick return being now a great consideration in farming, with as little risk of capital as possible, it does not appear that the ordinary tenant-farmer in the United Kingdom can be relied on to keep up the carriage- and saddle-horse supply, especially since the production of beef and mutton has become so profitable. Cattle can be turned advantageously into the market in half the time required to mature carriage- or riding-horses, and sheep in one-third the time. True, horses are earlier saleable than they were some years ago, but still they do not go readily off under four years of age. Then, while there is no lack of good sound bulls and rams to breed from, there is a lamentable deficiency of stallions of this character. In fact, this is the greatest drawback to successful and extensive horse-breeding. Mr. J. B. Booth says:—"The great difficulty in the present day is to obtain a good sire to put mares to. It is the breeding from unsound sires which has caused many farmers to be disappointed in breeding horses, and so give it up. A law should be made prohibiting any horse affected with hereditary diseases (such as roaring, &c.) from serving mares; and I would require each stallion to be examined by a veterinary surgeon appointed by Government, and to be certified by him as sound, before he should be allowed to serve a mare." If I mistake not, steps similar to these have already been adopted in some parts of the Continent for the propagation of sound healthy stock. Mr. Booth used to breed a considerable number of horses, but owing to the difficulty of obtaining sound good sires, he has, like not a few others, almost given it up, and has taken to cattle-breeding, "with profitable results."

Mr. Finlay Dun states that he knows of two farms in Warwickshire on which the breeding of first-class hunting- and carriage-horses, though carefully attended to, proved commercial failures; and further, that he has known of scores of young farmers in the Midland counties enter with intelligence, zeal, and enterprise into the breeding of nags, but, for reasons fully stated in Mr. Dun's report (page 28), "the systematic breeding of nags is relinquished, and from the Irish and Welsh droves the young farmer finds it more profitable to purchase three- or four-year-olds, even though they now cost from 40*l.* to 60*l.*"

"Hacks," says Mr. G. A. Gray, Millfield, Wooler, "cannot be bred to a profit on any land. Hunters will not on the average pay for breeding." For many years Mr. Gray bred a great number of hunters, yet he adds:—"Although I have sold many individual animals for high prices, I am well aware they never paid me nearly so well as cattle or sheep would have done. Indeed, they generally proved a loss; and but for the pleasure of having such animals to look at, educate, and ride, I should not advise any one to breed them."

Mr. Thos. Forster, Ellingham, has bred this class of horses, but he says:—"I have given them up, and I know one or two farmers who have bred them for thirty years, and have also given them up. I can safely say that those gentlemen would have now been 5000*l.* richer had they never bred blood-horses, though they were considered to have bred them with more than ordinary success." Mr. T. H. Hutchinson has rather more faith in the breeding of hunters, hacks, &c., if proper care is exercised in the selection of sires and dams. He knows too much of the subject not to admit the risk as compared with breeding cattle or sheep, but "the prizes to be won are very tempting. For instance," he says, "I know a tenant-farmer this year who realised over 600*l.* for a three-year-old hunting-colt, and I have a two-year-old colt I gave 367*l.* 10s. for. These, of course, are extreme cases; but I know many farmers who have made money by keeping a good half-bred brood-mare, and have had the sense to send to a fashionable good sire." Turning to Ireland, Mr. Wm. Davidson, Esker, Queen's County, has known several farmers abandon breeding of hunters in favour of cattle and sheep, and he says:—"I have known gentlemen of independent means turn to horse-breeding, but I never heard them say, after a fair trial, that it paid well."

Until sounder sires are more readily available, at any rate, it is evident that we must look to landed proprietors, or gentlemen of "independent means," or to other countries, for the bulk of our supply of hunters, hacks, &c. There is strong and convincing evidence that, as a rule, these animals cannot be reared with profit. Therefore the ordinary rent-paying farmer must of necessity devote himself to some other kind of stock. In short, the rearing of hunters and carriage-horses in the present state of matters resolves itself more into a question of taste and fancy than of direct profit; and so those who live by the cultivation of the soil alone cannot afford it. But there is surely wealth and enterprise enough in this country to keep up British studs. Complaints have been raised that the best of our blood-horses have been, and are being, drafted to other countries. Whose fault is that? The matter is principally one of pounds, shillings, and pence. If more money were not offered by foreigners than can be got at home, depend upon it our best or worst stock would not be exported. To hold our own, therefore, as the country is able to do in this, as in most matters, we must just outbid foreign competitors in the case of horses as has been found expedient in the case of Shorthorns. It has been demonstrated that British noblemen and gentlemen, though in many instances at great cost, have successfully rivalled the foreigner in a struggle for the possession of the choicest Shorthorns. With quite as much effect might the nobility and wealthy people in Britain take their stand against all the world in the matter of maintaining and improving fancy and thoroughbred horses. When the enterprise of individuals, beyond as well as within the ranks of the practical tenant-farmer, has done so much for Shorthorns, is it not reasonable to conclude that, if public attention were fairly directed to the question, like results would be achieved in the equine department? In fact, relatively speaking, noblemen and gentlemen, as a rule, are more directly interested in the latter class of animal than the former.

On the subject of farm-, dray-, or draught-horse breeding and rearing there is not so much unanimity among the reporters as in the case of carriage- and riding-horses. Still there is not great diversity of opinion. All admit—no practical man could deny—that agricultural horses employed on the farm of their birth, or on which they were reared, are more healthy, hardy, and durable, and altogether give infinitely greater satisfaction than those brought in after they are full grown. There is substantial agreement of opinion also, it may be seen, that horse-breeding, even at present high prices, could not be profitably substituted to a large extent for cattle or sheep rearing. None of the gentlemen to whom application was made know of any farmer who has turned almost exclusively to horse-breeding from the production of either beef or mutton, but many state that they know of farmers giving up horse-breeding in favour of cattle and sheep, and the change has been attended by profitable results. Though, as a rule, horses are not the most popular or best paying kind of stock, it is the opinion of the majority of the gentlemen reporting, and of many more, that every farmer, as far as possible, should breed on his own holding the horses necessary for the work of the farm. Under very favourable circumstances, and so long as prices continue nearly at their present pitch, it is shown that some farmers may breed with satisfactory results many more agricultural horses than they require.

When a great deal of horse-labour was first accomplished by steam-power—when the railway superseded the time-honoured stage-coach and displaced many of the country "carriers"—it was supposed that horses would get very low in price. They did fall off for a time, but only to rise higher than ever. Breeding was partially given up, but latterly it has been resumed. For six or seven years back not a little horse-breeding has been carried on, but still the demand is ahead of the supply. Many people regard this as wonderful, considering that the agency of steam in various forms now accomplishes so much that formerly devolved on horse-power. The explanation of the matter is chiefly to be found in the increasing wealth and prosperity of the country. The growth of trade affords employment for more horses as well as men; and it is noticeable that in many cases as people accumulate wealth their stud of horses increases. Many now keep a horse or horses for pleasure, riding or driving, who had no such luxury twenty years ago. Then, as field-cultivation has improved and become more thorough, the work of the farm-horse has grown. The high-pressure system of feeding, and the hard work to which thousands of farm- and dray-horses are now-adays subjected, tend materially to shorten the lives of the animals, while the destruction of horse-flesh in City omnibuses and tramway-cars is very great, and has been increasing for several years. Taking all these circumstances into account, it should not be so difficult to understand why horses have been scarce. It does puzzle one a little, however, to account for them remaining so very high in price after the pretty general return to breeding which has been observable in the course of the last few years. Good young farm-horses ready for work could not have been bought for some years at less than from 80*l.* to 120*l.*, a common figure being 100*l.* For all practical purposes this is too much. Even at 25 per cent. less, the breeding of agricultural horses to a moderate extent should pay on farms in any way adapted for the purpose.

Farms suitable for horse-breeding are those with moderately sized fields, good hedge or stone-wall fencing, a range of permanent or roughish pasture of ordinary quality, land free from small stones, and in a moist climate. Very highly rented arable land—say over 50*s.* an acre, where there is only a small portion in grass, and where much of the farm-work is, as Mr. Coleman says, in shafts—is not well adapted for the breeding of horses. Even though a considerable breadth of the farm were in good permanent grass, it is probable that the fattening of bullocks would pay better than the rearing of horses. On farms wholly arable and under a regular rotation, especially if near large towns, in-foal mares are unfit for the work all the year round. The hard labour on such farms, and the rough usage to which horses are sometimes subjected by careless and incapable servants, often produce abortion; and though the mares work steadily and tolerably safely up almost to foaling time, they cannot keep up the end of the yoke five consecutive hours for some time after foaling. If they are yoked or worked soon after foaling as steadily as before, both mother and progeny are very liable to injury. Apart from the crushing nature of the employment on heavy-land arable farms, and the inconvenience, not to say loss, of having a team broken by a mare foaling at a busy season of the year, the expense of keeping young horses on such holdings operates against extensive breeding. Young horses cannot go steadily in the yoke on these farms until they are four years old, and even at that age they require more careful handling and gentle work than in nearly every case they obtain. It will be found that, allowing sufficiently for the costly character of the keep on a farm of this description, good young horses cannot be brought to harness under seventy sovereigns. Calculating the deterioration of the mare, the loss of her work for a part of the year, and service fee at 16*l.*, the first year's keep of the progeny at 10*l.*, the second at 15*l.*, the third at 17*l.*, and the fourth at 12*l.* (the animal can do a little work the fourth year to lighten its keep), we have the 70*l.* referred to. Now, these estimates proceed on the assumption that the colts thrive well and escape accidents, to ever so many of which they are liable.

Though these results and other matters rather discourage the breeding and rearing of horses on highly rented all-arable farms of strong soil, there are exceptional circumstances in which, even on such holdings, the animals may be bred. For instance, if the tenant has a particular taste for horse-rearing, is a good judge of horses, selects sound good animals to breed from, can have his breeding mares in very careful hands, and has his farm substantially fenced, he may breed profitably. No doubt it might cost him fully 70*l.* to bring good youngsters steadily to the collar, but he might still be the gainer, for first-class animals would at present cost him perhaps 20*l.* more, and he would have in addition the satisfaction and advantage that are commonly experienced with home-bred animals. If, however, he has no speciality in the equine way, and cannot conveniently arrange to save his mares after foaling, and work them lightly for some time before, it is better to purchase than to breed, especially if he does not happen to be in possession of first-class mares, and has not access to the best of sires.

While horse-breeding on dear arable land, even to the extent of the farm requirements, can thus only be in the present state of matters successfully adopted in exceptional cases, the bulk of the evidence before us goes to show that on most other farms agricultural horses can be bred and reared to advantage. Very steep hilly land is not suitable, but on a large proportion of the holdings in this country a few breeding-mares are profitable. The smaller farmers have generally the best opportunities in this respect. Their work is comparatively light; and they have this further advantage—the greatest of all perhaps—that the animals are either worked, or strictly looked after, by the farmer or some of his sons. With access to a range of rough pasture, moderately rented land—say from 15*s.* to 30*s.* an arable acre—with well-fenced fields, rather moist climate, and, above all, a comparative absence of small round stones in the land, horse-breeding to a moderate extent pays the smaller farmer just now better than anything else. One small farmer of my acquaintance the other day refused 80*l.* for a 2-year-old colt of his own breeding, which was about double his yearly rent. There can be no mistake about horse-breeding paying such a man. The expense of rearing is of course much less on these farms than on stronger soils. The deterioration of the mare and loss of work would not exceed 10*l.*, the first year's keep of the colt 8*l.*, the second 13*l.*, the third 15*l.*, and the fourth 6*l.* This gives a total of 52*l.*, which would rear the animals well. Thousands of good horses I know are brought to the yoke at less than 50*l.* each. In fact, on moderately sized farms of lightish land horses work for their keep the fourth year, which would reduce the above estimate by 6*l.* The service-fee has not been taken into account, but a few pounds would cover that. In many instances every shilling beyond 50*l.* obtained for young farm-horses is clear profit to the breeder and rearer. A glance, then, at current prices should satisfy any one of the profitableness of agricultural horse-breeding under the favourable farming circumstances described.

The occupiers of very large holdings, even with a good run of pasture and moderately rented land, cannot breed horses to the same advantage as the smaller farmers. With the former, the proportion of miscarriages and the percentage of loss from accidents to foals and colts are much greater than with the latter. That arises, as most practical people will understand, from the inability of the larger holder to extend that amount of careful treatment and close personal attention to the tender animal which is characteristic of the smaller occupancy. The ordinary large farmer considers he does very well if he manages to breed and rear as many horses as will keep up the necessary stud. Colts, to be sure, are very troublesome, hard on fences, and injurious often to grass. In many ways they are more or less mischievous and annoying about the farm; but all that can be borne with when, between the ages of three and four, they can fill a vacancy in the regular staff, thus saving a direct outlay of 80*l.* or 100*l.*, or realize that amount if they can be spared for the market. The horse-market, by the way, is not the safest place for a farmer to invest. Many have dire experience of the trickery and the misrepresentations that characterise the British horse-market. It is quite a common thing, when a horse or two can be spared, to draft away animals that are subject to any ailment, or about which there may be preliminary symptoms of hereditary or other defects. This gives a somewhat rotten tinge to the horse-market, and lends an additional incentive to home-breeding wherever it can possibly be carried on. It should have been mentioned that in many parts of the Midland counties of England horses do a little work between the ages of two and three years. At that age the animals form part of those long, unwieldy—to me unsightly—teams of three, four, or more horses, pulling away in single-file order at one plough.

Those who confine their attention principally to horse-breeding are not numerous in this country. The reporters seem to know of few, if any. Mr. Lawrence Drew, Merryton, Hamilton, near Glasgow, is almost the only man of my acquaintance who has given up sheep, and to some extent cattle too, in favour of horses. He found the climate too moist for sheep, and horses have paid him better than either Shorthorns or Ayrshire cattle. His horses, however, are well known to be of the best class. There are no better, and—excepting Knockdon, Ayrshire, and Keir, Perthshire—perhaps none as good, taken all in all. Mr. Drew, I should think, has the largest breeding stud of Clydesdale horses, having upwards of forty brood-mares. The climate is favourable for the growth of hair, so much prized in the Clydesdale; the soil and situation of the farm are well adapted for the growth of bone and muscle. He has got possession of the best material; and as he knows how to use it, having a great taste for horses, and an excellent knowledge of them, he generally gets what might almost be termed fancy prices. Nevertheless, in the favourable circumstances in which he is placed as regards sires, climate, good blood, the closest of attention, and the best of judgment, it is not all prizes with him. He has many blanks, through death of foals, &c., thus affording another proof of the riskiness of a horse-breeding stock. To enable one to breed and rear horses extensively and profitably for sale, there must be rare adaptability of soil and climate, the best of blood to work upon, and good judgment as well as a great liking for the business on the part of the owner. Very extensive horse-breeding is, therefore, in these days of quick, and generally remunerative, returns from beef and mutton, only a thing for the privileged few to attempt.

Much of the disappointment and loss arising from attempts at horse-breeding are due to the imperfect attention bestowed on the selection of mares, and to the present unsatisfactory arrangements for access to entire horses. Mr. Gilbert Murray says that in Derbyshire the great barrier to improvement in horse-breeding "is the want of good stallions." Mr. Finlay Dun says, "that in the midland counties good brood-mares are scarce. Stallions, though sufficiently numerous, generally lack size, quality, and action, and receive inadequate encouragement from the usual service fee of 20*s.* per mare." Mr. L. C. Chrisp says, "horses to breed and rear are the most expensive, most exhaustive, and most uncertain stock a farmer can have." "The only profitable way," says Mr. Ranald Macdonald, "in which a farmer can rear horses is by having a few well-bred mares forming a proportion of the agricultural horses on the farm, and arranging the work so as to be able to rear a foal annually for every two pair of horses kept on the farm." Mr. Charles Howard says that "the breeding of good agricultural horses pays." Mr. George A. May, speaking of the Tamworth district, says, "the entire horses that travel about here are not good, and I think the difficulty of getting a good one hinders many farmers from breeding."

Referring to Forfarshire, Mr. Goodlet, Bolshan, very truly remarks, "we have no great choice of good stallions, and such as travel to serve mares get too much to do. Again, most farmers who are in the habit of breeding and rearing young horses are not very particular as to the kind of mares they breed from, and the consequence is an inferior progeny." From Mr. Lawrence Drew we have the following:—"I think cart stallions serve too many mares as a rule; about a hundred is quite common; I think sixty is a sufficient quantity, as I believe there would be more foals from the sixty mares than from a hundred, and the horse would last longer." I would also invite attention to Mr. John Wilson's remarks on horse-breeding (p. 13).

Farmers are not nearly so careful as they should be about the descent and soundness of the mares from which they breed. In too many instances stallions are put to mares with hereditary and other defects, thus producing stock of an unsound and unsatisfactory character. Nor are farmers fastidious enough in the selection of stallions. They have not hitherto had great choice in many parts of the country, for the stallions that travel have neither been very good nor very numerous; many of them are unsound, and more of them get by far too much to do. As Mr. Drew says, it is quite a common thing for a horse to travel through a great range of country and serve over a hundred mares in the course of three months. I have known instances of horses serving 150 and even 180 mares in a season. Little but disappointment could result from such a course. How could any one expect many foals, or how could any man expect his horse to last long with such usage? It is a short-sighted policy for the owners of the stallions, and results in dissatisfaction, if not loss, to the owners of the mares. I know of one large Border farmer who last season depended on the ordinary travelling horses of the district for the service of twenty-two mares. The result is that he only expects two foals. Had he, in company with perhaps a few of his neighbours, purchased a good stallion, the chances are that he would have had at least one foal for every two mares, or perhaps two foals for every three mares. If horse-breeding were his object, he would have clearly profited by having a good horse resting at home, serving only mares in the immediate district. Experience has shown what may readily be believed and accounted for, that a great many more foals are left by stallions who are kept at home during the season, or make very short, easy, and few rounds.

Mr. Drew's suggestion that sixty mares should be the maximum allowance for a horse, and Mr. J. B. Booth's proposal to have every stallion subjected to a skilful and testing examination, are well worthy of the favourable consideration of Agricultural Societies, and of landlords and tenants throughout the country. No doubt this restriction of the number of mares, as well as the precautions against the use of unsound animals, would necessitate a considerably higher charge for service than has generally been exacted; but the farmers could well afford this, for they would have a better chance not only of getting a foal, but of obtaining a sound and healthy one. I believe that the owners of fairly good mares would find it advantageous to give, say, *3l.* for the service of a mare, the fee rising to *5l.* in the event of a foal. This, supposing the number of mares to be about seventy, would amount to some *300l.* for the season of the horse, which should be fair remuneration, especially when it is remembered that under this system stallions might reasonably be expected to wear several years longer than they now do. Of course, the owners of the very best horses would require, and would readily get, more liberal terms.

The ordinary farm-horses throughout the greater part of England, Scotland, and Ireland are of a mixed breed. Systematic crossing of native mares with Clydesdale stallions or Suffolk horses works a wonderful improvement on the animals—increases their size, bone, and muscle, and generally improves their action and their power. Some of the hardiest and best farm-horses have a little bit of blood or breeding in them acquired through the dam. In Scotland, the Clydesdale stallion cross has greatly improved the ordinary farm studs. In England, it and the Suffolk Punch cross are doing similarly good work; and in Ireland, specimens of these powerful and valuable breeds are being introduced with encouraging results. There is yet, however, much to accomplish in the way of further improving in size, and particularly in soundness and action, the agricultural horse-supply of the United Kingdom. For carrying out this much-needed improvement I think the Clydesdale is best adapted, though some prefer the Suffolk Punch. If farmers were nearly as particular about the individual qualities and pedigree, so to speak, of the horses they bred from, as many of them fortunately are in reference to the bulls and rams they use, they and the country would greatly benefit, and we should hear less of the unprofitableness and uncertainty of horse-breeding.

Cattle.—The correspondents are unanimously of opinion that cattle cannot be bred and reared with profit on every farm, and they are substantially at one on a point of even greater importance. With very few exceptions they believe that more cattle and sheep might be bred and reared if the farmers had more security for outlay on the land, more and better house-accommodation, and farmed their land better. Several of the gentlemen assert, too, that breeding, rearing, and feeding might be practised on the same holding much more extensively than has hitherto been the case, and with profitable results. From my own experience and observation, I believe that more of this sort of farming would leave better returns than are at present in many instances obtained. But, before recording the views which I have held strongly for years on this question, let me glance at the substance of what the reporters say. The Messrs. Booth are warm advocates of more extensive cattle breeding and rearing, especially where, as in their part of the country, there is a considerable portion of grass land. Mr. McCombie, M.P., also favours more attention to breeding and rearing. Mr. J. D. Dent holds that farmers would make better returns by breeding more cattle, and feeding them high all along, so that they might go off matured at two years old or little more. Mr. Gilbert Murray says that as breeding and feeding on the same holding pay best, farmers should adopt that system as far as the nature of the holding will at all admit. Mr. John B. Booth states that there are many farms in Yorkshire and Durham with grass land suitable for breeding, yet on these there is not more than one calf bred now where ten were fifteen or twenty years ago. He adds that "a great proportion of the land is now grazed by third-rate Irish cattle, which, in my opinion, do not pay the farmer nearly so well as he would get paid by keeping a good lot of dairy cows, making butter, and breeding and rearing his own stock for his farm; to say nothing of the losses which occur from the importation of diseases, such as pleuro and foot-and-mouth disease, on to the farm through purchasing." Mr. James Mollison, after advocating outdoor or indoor feeding of stock on almost every holding, goes the length of saying that wherever "stock can be fed, present circumstances strongly recommend that they should also be bred, and the rotation of cropping made as suitable as possible for so doing." Mr. Finlay Dun says, "to buy rather than to breed the live-stock of the farm is desirable where the land is heavy and retentive, rich and well adapted for feeding purposes, producing irritant herbage which scours or otherwise injures young animals, or causes cows or ewes to abort." There is much force in the observations of Mr. Macdonald, Cluny Castle, on this point. He says that instead of sending so many of the animals "from market to market in a lean state, running the risk of disease, exposure to cold, and, from these causes added to want of proper food, weakening their constitutions, and in too many cases carrying infection along with them, it would be more advantageous if an attempt were made, where the circumstances permitted, to combine the breeding, rearing, and feeding of cattle by the same person, who would then have an interest in selecting good animals to breed from, and in having the animals continually well treated and fed properly till they were fit for the butcher."

Mr. Riddell, Hundalee, one of the few farmers in Roxburghshire who breed cattle extensively, advocates more breeding even on what are regarded as feeding farms, and for the following reasons:—"1st. Because there is every inducement to keep the calves in an improving state from the period of their birth onwards. 2nd. It greatly lessens the danger of catching disease, and gives the occupier of land a regular and interesting employment during a greater part of the year." Mr. Ferguson, Kinnochtry, considers a regular breeding stock, whether of horses, cattle, or sheep, the surest system of farming in Strathmore, though a great many farmers in that part of the country—Perthshire and Forfarshire—have within the last ten or twelve years given up breeding, and have taken to the feeding of bought-in cattle, largely English and Irish. One result is that foot-and-mouth disease is more common in those districts than it would probably be were the farmers less dependent on droved cattle. Mr. Copland Mill, of Ardlethen, Aberdeenshire, truly observes that "by housing the calves early in the autumn you never allow the *calf-beef* to go off, and thus have them ready for the market when they are from twenty to twenty-seven months old. I have adopted this system for the past twelve years, and for the last three have realised from 30*l.* to 35*l.* per head." Mr. Currie, Halkerston, thinks there are too few cattle bred, and says, "on farms where the five-course rotation is the rule, cattle pay to breed and feed." "When there are two-fifths to one-half or more of the farm under grass," says Mr. Leslie, Corskellie, "breeding all the stock you can fatten is the most profitable, owing to the high price that has now to be paid for good young stock, as well as the difficulty in getting them." This view is supported by the testimony of Mr. George Street, Maulden, Bedford, who says, "on ordinary arable farms, with a fair proportion of grass, I think it better to breed all kinds of stock required for the farm."

There is a considerable number of farms, particularly on clay soils, which are unhealthy for a young or breeding stock.

Then in the vicinity of large towns there is often very little grazing land. Here, as on the unhealthy farms, it would be unwise to attempt extensive breeding. Good store cattle bought-in to fatten during the winter on turnips, straw, and cake, pay better than breeding in such circumstances. Also some naturally rich land in high manurial condition is better adapted for a feeding than a breeding stock. Indeed, I know several tenants of very highly conditioned farms who had to give up breeding because the nutritious nature of the grass and roots made the cows too fat for regular breeding, which in the case of a pure-bred herd signifies a heavy loss. On very highly rented land, too, buying stores finds more favour than breeding. The more liberal use of cake on a feeding than on a breeding stock helps to maintain the condition of the land. I readily grant that in these exceptional cases breeding and rearing are not so profitable as feeding, but I still hold that a very much larger proportion of British and Irish farmers could with benefit to themselves combine breeding and rearing with feeding. Let us see what those who prefer buying and feeding to breeding and rearing, in certain farming circumstances, say for the system. "Of late years," says Mr. Smith, West Drums, "the better class of English and Irish cattle with which I have had chiefly to do have been bought at rates yielding a better return for keep than would have been obtained by maintaining a breeding stock with its many hazards." This opinion is shared by many. No doubt occasionally, when the lean animals can be bought at low prices and the fat disposed of at high rates, and especially when the better sorts can be got, the farmer may have less risk and about as much profit with a feeding or *flying* stock as with a regular breeding herd; but in the long run, there can be no doubt the man who breeds as well as feeds has decidedly the best chance. He not only then has the breeder's profit, but the feeder's too; and if he bestows anything like care in the selection of his bulls, fosters his calves well, and feeds them liberally all through, he has this satisfaction and reward, that the food will not be wasted. The home-bred animal, if it is liberally fed and properly reared, will keep constantly progressing; whereas a month's good feeding or more is often bestowed on bought-in cattle, that may have suffered from scant feeding and otherwise bad usage, before the brutes show the least signs of thriving. When they do begin to take on flesh and fat, if they happen to be, as many of them are, ill-bred, they make comparatively slow progress, and are never worth so much per cwt. as the better class of home-bred beasts. The question is not so much one of whether the buying-in and feeding of droved cattle pays the farmer, as whether the breeding, rearing, and fattening a good class of cattle on the farm, though involving closer attention, would not pay much better. My opinion has long been that it would, and I have neither seen nor heard anything lately to shake my conviction, always excepting holdings of the character already described as specially adapted for feeding only.

Mr. Clay, Kerchesters, one of the most successful stock-farmers on the Border, says that, "cattle can be bred and reared on the old grass lands of Yorkshire, Cumberland, and Westmoreland, cheaper than we can raise them on our arable or even grass land. The coarser grasses seem to suit them better, and the change to our richer feed seems to act to great advantage." Roxburghshire is not a cattle-breeding county, though I can see no reason why much of it should not be, except that it is specially suitable for the production of half and three-parts bred sheep, which have for several years paid better even than cattle. Mr. Gray, Millfield, Northumberland, says, "cattle are most suitable on deep rich land, which is less kindly for sheep than lighter soils, and on which sheep are apt to get foot-rot, and, if damp, may rot." Mr. L. C. Chrisp has no doubt that "if cattle could be well reared from their birth, it would be very advisable to breed them, and in no manner can they be so satisfactorily brought up till eight or ten months old as by allowing them to suckle their dams." Calves are better to be allowed six or seven months milk; but that adds so very much to the cost of rearing, that with carefully prepared substitutes for milk three or four months are sufficient, or less might do, provided the animals are in skilful and careful hands. Mr. Charles Howard says that on all fine grazing lands where rents are high, and also where the farms are almost all arable, it is preferable to buy store cattle. Mr. A. R. Algie, a large and experienced Irish breeder and feeder, remarks that "on a farm purely tillage, with a short supply of grass land, it is more profitable to purchase stock for fattening on roots and artificial foods, than to rear and fatten a much smaller number." Speaking of the lower, drier, and higher rented parts of East Lothian, Mr. Smith, Stevenson Mains, says, "store cattle can be bought cheaper than they can be bred, for this reason, that there are counties better adapted for rearing cattle, viz., those counties which have a more humid climate better suited for grass." Mr. Linton, Sheriff Hutton, considers that the only circumstances to prevent a farmer breeding the cattle that he can fatten, "are when all or nearly all his grass land is capable of fattening, and is too good or, rather, too high-rented to be used for breeding purposes." Mr. R. H. Masfen, Pendeford, near Wolverhampton, notes that "there is little food for cattle during the summer months on a large portion of the arable land in this and many other districts."

From Lincolnshire we have the following statement from Mr. Henry Sharpley, Acthorpe:—"When the grass land belonging to a farm will fatten cattle without artificial food, or when a farm has scarcely any grass land upon it, it will then pay better to buy cattle, to feed in the one case, or to put them in the fold-yard in the other." Mr. George Hope, late of Fenton Barns, speaks of the Lothians as better adapted for feeding than rearing stock. Mr. Scot-Skirving, whose farming experience has been chiefly acquired in East Lothian, thinks there is very little profit on feeding cattle, but they are, he says, "necessary evils to make manure." When the bought animals take disease, and are purchased at high prices, the margin for feeding is often small. If the animals were bred on the farm or in the district, the profits would be steadier and greater. There are, however, several farms in the lower parts of such counties as the Lothians, more particularly East Lothian, where breeding is impracticable from want of summer keep. Moreover, sheep-feeding is preferred there in summer on account of the dry climate; also in Norfolk, for example, where there is very little grass and a great deal of root-crops, it would be impracticable to breed nearly as many cattle as would be required for winter feeding. Mr. George Mitchell, St. John's Wells, Aberdeenshire, gives some statistics showing that the practice of feeding, to which he has lately resorted, pays better than breeding and feeding together. I do not doubt his figures, but it has to be considered that he manages to get good home-bred crosses from Caithness and the north, which prove better than the mongrel-bred, hide-bound, half-starved creatures that reach the north of Scotland from Ireland or even England, after undergoing much privation at fairs and on railway journeys throughout the country. Instead of purchasing from the "Irish droves," Mr. Mitchell finds it more profitable to compete with the local butcher for the three-parts finished native cattle that may come into the district markets under the designation of fat. A few months' keep of such beasts generally leaves as many pounds to the feeder. They are easier sold than the rougher framed, bigger-boned, lighter-fleshed lots, and the great risk of disease is obviated. But the scarcity of the better class of home-bred lean beasts in the market, as well as of good half or three-parts finished lots, makes it impossible for many to work as Mr. Mitchell does.

Mr. James Cowie says that fair keep to a breeding cow on grass, turnips, and hay or straw, would cost from 10*l.* to 15*l.* a year. I have found that 12*l.* a year keeps ordinary farm cows on this fare tolerably well; of course heavily milked cows cost more. In city dairies, or those that send sweet milk to towns where keep is dear, double the amount named would scarcely suffice; but there, rearing calves is out of the question. Both roots, hay, and grass, as well as milk, must be of less value to warrant breeding and rearing of young stock. Mr. Cowie says that a cow might foster three calves a year. No doubt she might, but the last one would be very late. If a cow brought up two calves a year, and did it well, the business would pay, provided proper bulls were got, and liberal feeding carefully bestowed on the calves after weaning. Supposing that a fairly good milker only nursed two calves, and bred one every year, what would be the farmer's profit? One of the calves and the milk for the two would be all that the farmer would have for the cow's keep for a year, already estimated at 12*l.* Well, say the buying price of the second calf is 4*l.*; to this 16*l.* let us add 9*l.* for the keep of the two calves after weaning until they are one year old. Each animal at one year old would thus cost the breeder 12*l.* 10*s.* Now in recent years, good cross-bred yearlings liberally fed from calfhood, have realised from 14*l.* to 18*l.* But suppose the breeder to keep the animals on, as is more common, until they are about two years old, would he not be paid for generous feeding with 24*l.* a head? The fact is, well descended and attentively fed home-bred two-year-olds have been fetching from 25*l.* to 35*l.* a head for several years. Only last November, Mr. Walker, Altyre, whose report will be found among the others, sold Sir W. G. Gordon Cummings'· "crop" of cross-bred six-quarter olds at 24*l.* 15*s.* a head. By the time these were two years old they could easily have been made worth from 30*l.* to 35*l.* They had been generously and regularly fed throughout, but got nothing of an extravagant nature, only turnips, grass, straw, and some cake. The sire was a good Shorthorn bull, and the cows mostly first cross from Shorthorn and Aberdeen. The soil is light, and the climate one of the driest in the kingdom. In short, the soil and climate at Altyre are such as many would consider specially suitable for sheep rearing and feeding. Yet the facts adduced show what the farm can do in the rearing of cattle.

I doubt not many farmers may say, "Why should we trouble ourselves with a breeding-stock? we can get as many yearlings as we want at less than 12*l.* 10*s.* each." Too many, alas! can be bought under that figure. Hundreds can be purchased under it for one over it. But are they such a good bargain as the higher-priced, well-kept sorts? After all my experience and investigation, I cannot bring myself to the conclusion that, all things considered, they are.

Even in the Border counties, where a tolerably good class of cross-bred cattle can be had, from either the English or Irish breeding districts, I lately had a good opportunity of judging of the superiority of home-bred cattle. Inspecting a lot of well-bred animals, rising three years old, in the commodious court-yards of Mr. Robson Scott, of Newton, Roxburghshire, in October last, I called attention to an animal that was evidently the worst of the lot. "Oh!" replied the steward, "that's the only one in this yard that was bought-in; the others were all bred by ourselves." There was certainly a very marked difference, and the animals had for a long time been subjected to the same feeding. While the bullocks bred by Mr. Scott were worth from 35*l.* to 40*l.*, the ox bred nobody knew where would have been dear at 28*l.* And this animal was far from the worst—indeed, he was above the average—of the age and breed I saw during a week's tour on the Borders. In that one court-yard at Newton the great advantage of keeping on the calf-flesh was demonstrated in an instructive and unmistakable manner.

Nor are the enhanced prices for the home-bred beasts the only benefit arising from breeding, rearing, and feeding, where at all practicable on the same holding. Many farmers do not require to be reminded of the great advantages of having their feeding-stock descended from at least a well-bred bull. The cows may also be of a pure breed, but the bulls must. Though happily a large number of farmers are fully aware of these facts, not a few, unfortunately, are either unaware of them, or are comparatively unconcerned in the matter. Some of those who do breed cattle appear to think almost any sort of bull sufficient; that is to say, they are not particular as to whether the animal is pure of its kind. If it has a dash of Shorthorn blood and plenty of carcase they seem satisfied. It is almost needless to say that from such bulls the stock will not be nearly so good as the produce of pure-bred animals. There is nowadays no excuse for, but very strong objection to, the use of cross-bred or non-pedigree sires. Shorthorn bulls, of pure and tolerably long descent, are neither difficult to get nor unreasonably dear. During the past year, while in some parts of the country nondescript bulls were in service, numbers of the better-bred young Shorthorn bulls were almost unsaleable, even at very small prices. It was freely said last year in England that bull-breeding was rather overdone, that the knife was too sparingly used on the calves. To some extent that may be true; but I believe that if the farmers generally throughout England were as careful as they ought to be, not only in avoiding mixed-bred bulls, but in selecting well-descended sires, there would have been fewer young bulls withdrawn or sold at a sacrifice at many of the English Shorthorn sales. This idea is supported by the state of matters in the north-eastern counties of Scotland. Perhaps in no similiar area in the United Kingdom are so many bulls bred as in the lower parts of Aberdeen, Banff, and Moray. It is known, also, that the common type of Shorthorn in that part of the country, though of a substantial, thick, fleshy, hardy, useful sort, is neither of the most stylish nor fashionable. In that district last year, numerous as the crop of young bulls were, a ready demand and remunerative prices were experienced. The averages were higher there than in the south, where the pedigrees would have led the owners to expect more. This circumstance is attributable, I think, to the fact that in those counties every farmer has now become convinced of the potency of a pure-bred sire. Non-pedigree bulls have been discarded; and if they were so in other parts of the country, we should have better bull-sales and infinitely superior cross-bred cattle, or rather, we should have fewer weedy shabby-looking beasts than have hitherto appeared. A decently good Shorthorn bull-calf can be bought at 35 or 40 guineas, but even though for crossing purposes a farmer went the length of 100 guineas for an extra-good animal, he would ultimately find himself much nearer his purpose than trusting to a cross-bred beast at 12*l.* or 15*l.* The latter animal, somehow, cannot with any degree of certainty transmit to his stock what little good properties he may have, while the former not unfrequently leaves better stock than himself. As a rule, the better the pedigree the more noticeable is the improvement on the progeny. Cross-bred animals thus well descended come earlier to maturity, take on more flesh, and give a better return for a given quantity of food than those from a non-pedigree bull, no matter how well come the cow is.

Now, if farmers would breed and rear the animals they feed to a larger extent than at present, they could have a better-bred sort of beast by using only pure bulls. That in itself would be a great gain; but there are other advantages from home-rearing. It gives the farmer a deeper and greater interest, not only in his stock, but in his farming business. Those who breed, rear, and feed successfully, take something like a pride in the business, and are induced to look better after many things about the farm than they would otherwise do. A breeding stock undoubtedly requires closer attention on the part of the farmer than a feeding one, but few will sympathise with him on this score. He is all the better, and nobody is any the worse for his attention being steadily directed to his business. Another very weighty argument in favour of breeding and feeding combined is that there is much less risk from disease. I know of several farmers who breed and rear their own stock, or nearly so, and who have never had either pleuro-pneumonia, foot-and-mouth, or any other infectious disease on their premises. These lucky farmers happen to be located in districts where breeding and rearing are common. If they were not, I fear they would have fared differently. Home-breeding affords no security from disease if only adopted by a farmer here and there, with the neighbours trafficking among stock brought by rail from all parts of the country. Warmly as I advocate breeding, I should have some hesitation in advising any farmer to go in for a stock of cows and young animals, if his neighbours worked with a *flying* stock, especially as long as disease is so rife as it has lately been. Breeders situated in districts into which stock are imported extensively, and often recklessly, are not to be envied. Their risks are very great, and their losses from disease in recent years have not been light. So frequently do droved or imported animals bring disease with them, that at least, until foot-and-mouth is more successfully grappled with, the advantages of breeding on the farm will largely depend on what course one's neighbours adopt. By neighbours I mean the farmers generally in the district. My contention, however, is that, making due allowance for unhealthy grazing land, highly rented farms, and scant grazing accommodation, whole districts would benefit by more home-breeding and less dependence on the inferior sorts that form the majority of the bought-in lean beasts.

On the other hand, if the breeders were to a considerable extent also the feeders of the animals, we should see more attention paid to the character and qualities of the sires used. Hitherto, from a sadly mistaken notion, many of those who breed cattle, and sell them either as calves or yearlings, are not so scrupulous as they ought to be about the bulls to which they put their cows. They know that they will soon be clear of the progeny, and so they are less fastidious about their descent than if they finished the beasts off for the butcher. It is true that, in Ireland especially, there has lately been a great improvement in the quality of the cross-bred stock, through the more extended use of well-bred Shorthorn bulls. There are still, however, an immense number of very indifferently bred beasts, both of Irish and British extraction, sold lean. It may be said that feeders or rearers are partly to blame for not encouraging better breeding more, by giving considerably higher prices for the well-descended sorts. No doubt any farmer would give more for properly bred calves or stirks than for others; but one cannot judge fully of the animals' superiority so early. While one can have a pretty good idea of well-bred calves or stirks, the real merits of the animals cannot be so accurately gauged until "feeding" begins. Then there are so many ill-bred creatures among the large lean lots, or droves, from which the feeder has often to pick, and even the better-bred beasts look so ill after so much driving about and inadequate feeding, that the breeder or dealer does not in every case get the encouragement he would otherwise receive. Either farmers do not in sufficient numbers appreciate thoroughly well-bred animals as they should do, or the breeders and dealers are not in a position to measure such a preference by materially enhanced prices. In the present unsatisfactory state of the lean-cattle trade, particularly with Ireland, the farmer cannot reliably ascertain the descent of the stores he feeds; but by breeding more of them he could know better what he was about, and would pocket more money in the end. Never supposing that all farmers could breed and rear nearly as many cattle as they feed, I would strongly urge on those who buy "stores" (1) to avoid the glaringly ill-bred brutes, hundreds of which are dear at any figure; (2) to use every possible means of ascertaining the breeding of the animals; and (3) to pay handsomely for good varieties when they can be had. If this were systematically attended to, there would soon be a greatly superior race of cattle in the market. Were farmers to studiously shun the inferior lots, and create a good demand and remunerative sale for the nicer sorts, they would give the most powerful incentive to improved breeding and rearing that could be imagined. It is not enough to say that thousands of farmers already endeavour to do what has just been described as so desirable. Granted that they do, can it be denied that thousands make no such attempt? If that were denied, I should like to know where all those Irish and other droves of calves and stirks go, that frequent one leading fair after another in various parts of the country. No reflecting person can see those emaciated hide-bound creatures, without feeling that the dumb brutes themselves have come through some unkind, ungenerous, nay, even cruel hands; and that whoever was foolish enough to saddle himself with the fattening of them was surer of his work and outlay than his profit.

I venture to affirm that a calf from a moderately good cow and a pure-bred Shorthorn bull, is better value to the rearer and feeder at 5*l*., than one of the same age, from a nondescript sire, is at 5*s*. The one will consume quite as much food as the other, and, as a rule, the better-bred animal can be easily sold at two years old for about 30*l*., while the other will fetch little over 20*l*. If farmers, almost to a man, could be convinced of this, and the owners of dairy cows, as well as other breeders of calves and stirks for sale, made fully aware of such a conviction, pure-bred bulls would soon be universally in service in the great dairying districts. What fine growing and feeding crosses, for instance, could be bred from the strong sappy cows in the dairies in Somersetshire, Derbyshire, and Cheshire, if only a pure Shorthorn bull were put to them! Instead of the calves, at 8 or 10 days old, barely realising 3*l.*, they would fetch 5*l.*, and prove better bargains. If dairymen could only realise it, they would, or at least should, have more profit by securing a pure-bred bull than by resorting to almost any sort of animal that would bring the cows into milking form. In this direction we must look for some of the desired improvement in British feeding-stock; and if proper steps were taken, we should not long have to look in vain.

Division of labour is in certain circumstances a good thing; but hitherto, and particularly within the last five or six years, the labour of breeding, rearing, and fattening cattle, has been divided to an unprofitable extent. Many of the occupants of good breeding and rearing farms are carried away by the unfortunate notion that "we could not breed and rear them so big at the money as we can buy them." Very likely not. Size, however, is but one thing; quality, ready feeding properties, and symmetry, should be the principal aim. That being so, my reply is, "if you cannot breed them so big *at the money*, you can easily bring them to even greater size and of infinitely superior quality at the same age, and with a better balance at the year's end." Another view of the matter is, that the breeder and rearer would in all probability have a better return if he bred fewer, and fattened some, or all of those he sold, "big for the money." These remarks naturally bring the Irish cattle trade into view. Store cattle from that country, to the value of about 10,000,000*l.*, are annually imported into England and Scotland. They are bred and, so far, reared cheaply in Ireland, some of the correspondents say. No doubt of it; but what sort of rearing is it? Is it not half-starving in many cases? and do not large numbers of those ill-conditioned animals—walking evidences of a somewhat slovenly and unsatisfactory system of husbandry—form the most fruitful source of disease in this country? Moreover, on hundreds of them how much good food is comparatively wasted on this side the Channel! It is not because they are Irish that these beasts spread disease, and in many instances thrive unsatisfactorily, but owing to the treatment they receive. The cattle of any country exposed to similar usage would be quite as bad. It is well known that on board the Irish steamers, on railways (both on this and the other side of the Channel), and at fairs, the Irish cattle are neither well fed, gently treated, nor supplied with comfortable accommodation. Then if disease is in the country, it is a wonder if they do not come in contact with it.

Both English and Scotch farmers would profit by the introduction of fewer Irish beasts, and Irish farmers would ultimately benefit by feeding more of their stock at home. Just as easily and as expediently as the British farmer could breed more stock, his Irish brother could feed more. Of course, more feeding in

Ireland would necessitate an extended cultivation of root-crops, but that is what many think would improve the country. Mr. Pringle, in his interesting paper on "Irish Agriculture," published in a previous number of this 'Journal' (second series, vol. viii., Part I., No. XV., pp. 1-76), went so fully into the defects of the Irish stock-farming system, that many remarks of mine are unnecessary. He, it will be remembered, advocated more green-crop cultivation, for which much of the country is well adapted. That would lead to a better system of farming, and to the fattening of a great many animals which are at present exported in a lean state. The use of cake in the feeding of these animals would soon tell on the fertility of the land. Those who do grow turnips, carefully shelter their cattle in winter, and finish them off for the butcher, speak favourably of the system. This, combined with other facts and circumstances, indicates that if Ireland is a breeding country, it can to a considerable extent also become a fattening one.

Though, in the interests of all concerned, I should like to see fewer store animals come across the St. George's Channel, there is no doubt that some will be spared from the Emerald Isle, and some will be required in Britain for many years to come. In these circumstances one thing pressing for improvement is the accommodation for cattle on board the steamers from Ireland, as also the means for conveying stock, especially store animals, by rail in this country. What the nature of these changes should be, I cannot in the present available space attempt to discuss; but it may be observed that, though the re-arrangement of the means of transit involved a heavier tariff, farmers could afford at least 1*l.* a head more if the animals were carried comfortably and with tolerable safety from disease. It is alike the interest of the Irish breeder and the English or Scotch feeder to press for radical improvements in the means of conveying stock from the one country to the other.

In many parts of England, the want of house-accommodation for winter operates seriously against the production of beef. Throughout the Western and Midland counties the steading capacities are very deficient on many farms. There is in those localities a large area of good permanent pasture, but, as in parts of Ireland, too much stress is laid on this provision. The worst feature of a holding largely under grass is a tendency to a feast in summer and a famine in winter. Generally, too, where grass land predominates there is a lack of steading accommodation. Not only so, but there is often little to give the animals in the house. The cold, exposure, and scant diet to which many of the cattle in England are subjected in winter is, perhaps, the biggest blot on the present system of British farming. Few more cheerless spectacles could be contemplated than the appearance of a lot of good cross-bred cattle standing in the open air, amongst frost and snow, nibbling away at a handful of hay, with their four feet gathered below them as if in a bonnet. This is not a very rare sight. Not many weeks ago, in the Midland counties of England, I saw hundreds of cattle picking away at a little hay or straw, and standing ankle-deep in snow. Such treatment as this would do for Scotch Highland cattle or Black-faced sheep, but to extend it to improved Shorthorn crosses is simply ridiculous. By the way, before advocating universal attention to the selection of pure-bred bulls, I should have recommended the abolition of the indefensible practice of open-air feeding in winter. So long as farmers are foolish enough to winter their cross-bred cattle little, if any, better than a Highland farmer does his Black-faced sheep, it is immaterial what sort of bull is used. The stock from any sire are too good for such treatment. It cannot be that so many of the English and Irish farmers are ignorant of the fact that comfortable house-accommodation is part food. They surely must know what has been so often laid before them in one form or other by high authorities, that when an animal is exposed to intense cold the bulk of the food is required to keep up the natural animal heat. Indeed, all the food supplied to exposed animals in severe weather is not capable of maintaining the natural temperature. Hence it is that cattle thus wintered, instead of taking on flesh and fat, lose a deal of what they had previously accumulated. Owing to the radical nature of the farm-improvements, such as more buildings, &c., necessary to completely supersede the objectionable feeding system alluded to, the change must take some time to effect. But any one who has seen, as I have, the great benefits of house-feeding over open-air feeding in winter proved to demonstration, can have no doubt both as to the propriety and great necessity of making the change as speedily as possible.

It is claimed as an advantage of the buying-in-store-stock system that you need only purchase what your supply of food, which is well known to vary in different years, can keep; whereas if you have a large breeding stock, you occasionally must part with some of them at a sacrifice, or purchase food at exorbitant prices. Well, this is a point in favour of buying, but only one, and it is trivial compared with so many on the other side. A specially good judge of store stock frequently does well purchasing, feeding for a few months, and then selling, but that requires faculties which are not possessed by nearly every farmer, and, unfortunately, are not getting more common. From almost every point of view the weight of argument is in favour of more breeding where at all possible on the respective farms.

As the cattle-trade is now carried on, a moment's reflection will show that there is a great loss of time, of flesh, and of beef-producing power. Just think of what many of the Irish cattle lose between their native pastures and their feeding quarters—perhaps in the more distant parts of England and Scotland! Just think of how long they are in their feeding hammels sometimes before they take on fat! Consider for a little how much more valuable they would be to the feeder in their own country, or to any one, if freed from the painful treatment so common in transit! Reflect deliberately on how much nearer his purpose the British farmer would be to breed and rear, keep constantly progressing, and turn off early ripe more of his own stock! These are questions which call for the most careful consideration of the British and Irish farmers at the present time. Breeding, rearing, and feeding combined wherever possible—and a combination to a larger extent than now is not only possible, but prudent—is the safest, surest, and best system of farming. In my experience, the holdings on which this course has long been pursued have been clearly the most profitable. I have in my mind's eye several cases in point, but I have not the authority of the tenants to mention names. The statement, however, is none the less true, and I commend it to the favourable consideration of every farmer whose land is not in the vicinity of a large town, is not of an unhealthy character for young stock, or is not almost all under cereals, root-crops, and hay.

Sheep.—The preponderance of the evidence is in favour of sheep as the most profitable kind of stock to the British farmer. Most of the writers speak of a mixed system of husbandry—part cattle and part sheep—as the most successful. And so it is; more especially if a considerable portion of the stock can be bred as well as fed. As a general rule, in recent years sheep have left more profit than cattle; this is partly due to the double source of revenue yielded by mutton and wool. As Mr. Charles Howard says, a good clip of wool comes in very handy, adding very considerably to the farmer's annual revenue. Sheep management seems to be better understood and more heartily gone into in many parts of England and the south of Scotland, than either cattle- or horse-rearing; and that helps the comparative profits of the fleecy tribe. The great rise in labourers' wages has also had something to do with the popularising of sheep. They involve less outlay in the form of agricultural labour than cattle do. Besides, they need less house-accommodation, and so are more suitable for many holdings which are scantily provided with buildings. Fed on cake, sheep will enrich the land better than any other kind of stock. The returns from them on arable land, especially if the soil is light and the climate dry, are quicker, and frequently also greater than from cattle. On all these points sheep have the preference; but where cattle management is properly attended to, the profits compare not unfavourably with those from a sheep stock. It need not surprise any one that sheep are regarded as the better paying stock in different parts of England; for while cattle are subsisting on the pastures in winter, with a little hay or straw in severe weather, sheep are feeding on turnips, hay, corn, and cake. Cattle have not thus the same chance of paying the feeder that sheep have. Throughout the Midland counties of England sheep consume the first, the best, and the most of the root-crops. In the south-east of Scotland, also, the fleecy flocks generally have the choicest of the farm produce. If that did not make them pay, what would?

It is decidedly preferable to fatten as well as breed sheep on the same holding. That, however, requires not merely a considerable extent of land, but a variety of it—some light moorish outlying ground and some good rich feeding, well drained, arable land. This combination is not general, and so there are many holdings devoted almost exclusively to breeding, and not a few also to feeding. Cattle will thrive in almost any kind of climate, but sheep require a pretty dry climate and well drained land. Excepting the mountain breeds, sheep are not profitable stock in a moist climate; foot-rot being destructive there. The best feeding districts are the Eastern and Midland counties of England and the south-east of Scotland, while the great breeding ranges are in the west and north of England and the west and north of Scotland. Of course, the mountain grazings are almost exclusively stocked with breeding sheep or lean growing wether flocks. Here fattening is out of the question, and even on the higher and more exposed arable farms feeding cannot be economically adopted. Mr. Tweedie, Castle Crawford, an extensive and experienced Lanarkshire farmer, informs me that he has fed on the turnip break a lot of the best Black-faced wethers he could get in the Falkirk market. Notwithstanding the hardiness of this breed, he found from the altitude (900 feet) and exposure of his farm, the feeding process was so slow that he had nothing except the manure for the turnips eaten. The excess of the selling price over the buying covered only the outlay for cake and corn. It is thus evident that the fattening of sheep in winter should only be attempted by the occupiers of tolerably well-sheltered dry land in a good climate. Sheep can be bred and reared on high, dry, light land, whether arable or not, more profitably than on dearer and better soil. The owners of a breeding-flock on cheaply rented dry farms have had a better time of it since 1865 than other farmers. This year especially, they must fare better than the feeder, dear as mutton is. Mr. Willison, Parish-Holm, Lanarkshire, who keeps over 20,000 sheep on several grazing farms in different Scotch counties, says, "I have found sheep-breeding more profitable than feeding." His grazings, however, are in the west of Scotland, where the climate is somewhat wet and unfavourable for sheep-feeding. Mr. R. Stratton says, "to breed sheep economically there must be dry sound pastures or downs, so that the ewes may be wintered at small cost. In many districts it costs 30*s.* to keep a ewe from November 1st till April 1st. As a rule, this must be a losing game." Probably it must; but where such an outlay is inevitable, a breeding-stock should give way to a feeding. Generally, breeding-ewes of the earlier maturing varieties are kept on farms where the pastures carry them on until January. A few turnips and some corn or cake are given during the first three months of the year. This is the common food where lambing begins about the end of February. But, of course, when the lambs commence to fall in January, the hand-feeding must begin earlier, especially if the weather in December is inclement. In most parts of the country breeding-ewes are wintered under 1*l.* a head, excluding prize ewes or animals breeding Showyard stock.

Several of the correspondents speak favourably of the results obtained from the introduction of a moderate sheep stock on farms previously allotted to cattle. This was, however, where the soil had been thoroughly drained and where the climate was tolerably dry. There are instances of Leicester sheep having been tried and given up on account of damp climate and soft soil. Mr. Drew abandoned Leicesters at Merryton because of the climate; and Mr. John Ralston, reporting from the south-west of Scotland, relates that with a half-bred flock of sheep he was a third short of his revenue from dairying, which he was obliged to suspend for a few years.

The south-western counties of Scotland, like the corresponding parts of England, are not very favourably adapted for sheep-rearing or feeding, especially feeding. They are better suited for dairying and horse-breeding. About Hamilton, where Mr. Drew's farm is situated, the registered fall of rain, I observe from statistics kindly supplied by Mr. Buchan, secretary of the Scottish Meteorological Society, is not much greater than in some parts of Roxburghshire and the eastern counties of England, where sheep do well. The gauge at Auchenraith, near Hamilton, last year showed a total of 29·38 inches. At Melrose the rainfall last year was 30·42 inches; at Swaffham, in Norfolk, it was about 30 inches. In West Hereford the rainfall for the eleven months ending November 30th amounted to 54·40. At Lissan, Cookstown, Ireland, the fall for the year was 40·23 inches; while at East Linton, in Haddingtonshire, the rainfall in 1874 was 23·93. The ordinary rainfall in the south-west of Scotland ranges from 40 to 60 inches per annum.

Though the total rainfall is not so excessive in the Hamilton district and in some other parts of the west, there is frequently a drizzling sort of rain, and the proportion of dry days is small. This is the case, also, in the greater part of Ireland, where sheep-rearing and feeding have not been so successful as cattle-raising. Where the land has been well-drained in Ireland, the management skilful, and the feeding liberal, mutton-producing has paid well enough, thus showing that imperfect management has something occasionally to do with what is attributed to climatic defects.

Owing to the elevated and poor character of a great portion of the sheep-breeding farms, it is impossible to carry on both breeding and fattening on the same holdings, excepting, as already pointed out, there be considerable variety of soil and a very large acreage. Thousands of breeding-farms have no feeding-ground, and, conversely, many good sheep-feeding occupancies are minus favourable breeding-land. The division of labour between the breeder and feeder in the case of sheep has, I think, more to recommend it than such an arrangement has in reference to cattle. The difference betwixt the breeding soil and climate, and the feeding, is greater in the former instance than the latter. Sheep are better pedestrians than cattle; are seldom driven about so much, and do not lose so much flesh journeying from the breeding-walks to the feeding-plains. They are also hardier than cattle, and are less injuriously affected by long fasts, particularly the mountain breeds. The buyer has little to dread as to the breeding of sheep compared with cattle. Almost every sheep-breeder makes a point of securing a good well-bred ram, which is not the case with nearly all those who breed calves. The purchasers of sheep know and appreciate this, and the breeders profit by the comparatively higher prices they obtain for the lean material. In short, what has been accomplished by the careful attention displayed in the selection of feasibly well-bred rams, even in the remote breeding-districts, might be a stimulus to the more extensive use of decently well "come" bulls. As there is scarcely anything said by the correspondents about sheep with which any practical man could not coincide, and as I have already considerably exceeded the space originally allotted to this Report, I need say nothing further than express my own conviction that the modern system of breeding, rearing, and feeding sheep forms, perhaps, the best-managed branch of British agriculture.

CONCLUSIONS.

The substance of the foregoing testimony may be stated thus:—

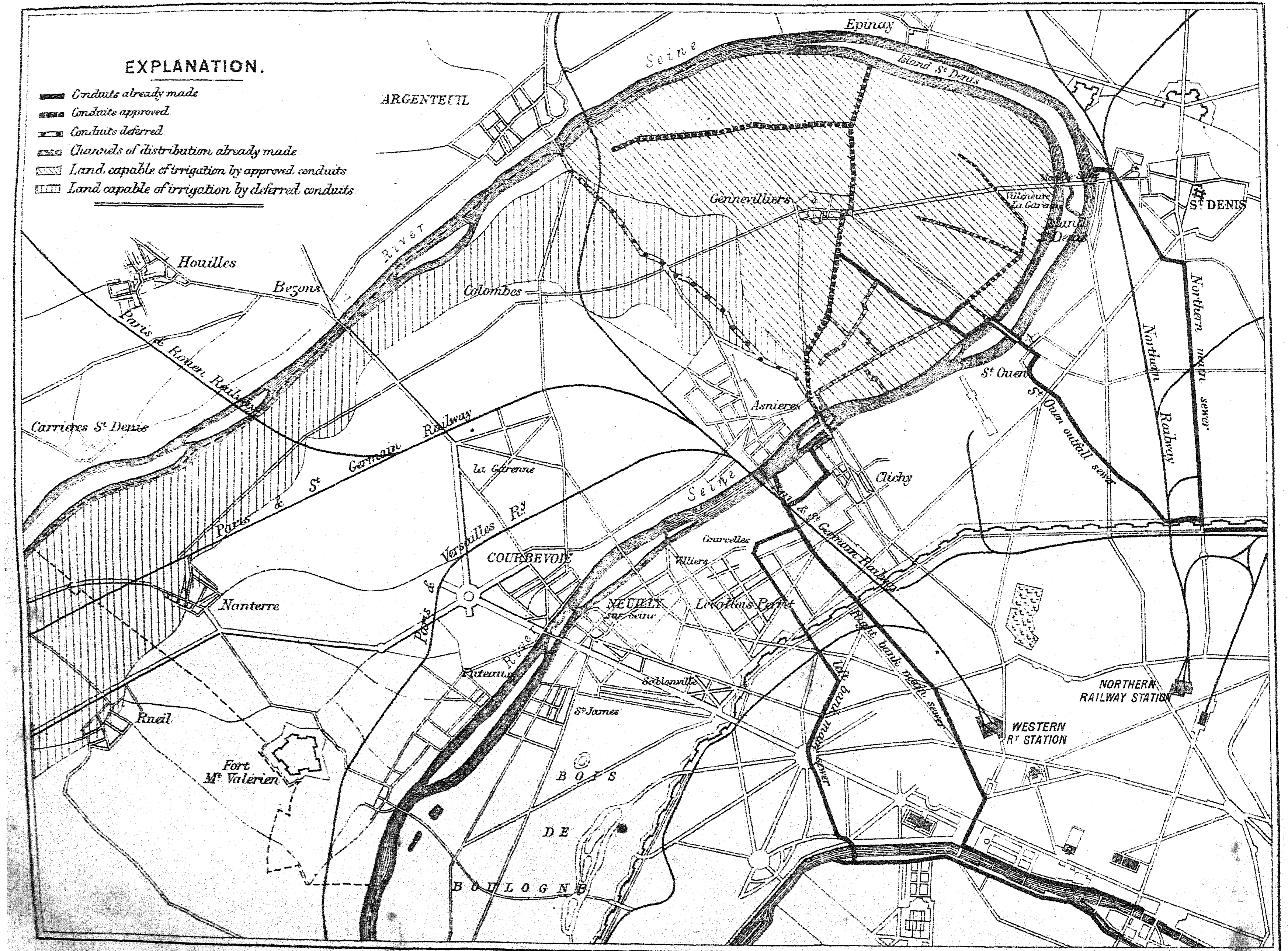
Horses.—Hunters and carriage-horses cannot be reared by ordinary rent-paying farmers with profit; agricultural horses should, with few exceptions, be reared on every farm to keep up as nearly as possible the ordinary working stud; on well-fenced holdings, with a considerable acreage of grass and roughish land, draught-horse breeding could advantageously, and should at present prices, be carried on beyond the working requirements of the respective farms. The great drawback to horse-breeding, however, is the want of good sound stallions.

Cattle.—Farmers would profit by breeding more on their own holdings, even though they fed rather fewer; and some of those who at present breed, particularly in Ireland, would benefit by feeding-off more of what they rear; while there is great need (1) for better housing accommodation throughout England and Ireland; (2) for more food and more shelter to the animals in winter; (3) for a more uniformly good bull-service; (4) for a generous and progressive system of feeding, so that the "calf-flesh" may not be lost, and the animals turned into the market good fat, at from two to three years of age; and (5) for more humane and comfortable means of transit, both by sea and land, especially from Ireland.

Sheep.—The double consideration of wool and mutton, the good management, the saving of farm-labour, and the quick returns, have naturally earned for sheep the reputation of being the best-paying kind of stock in Britain, though not in Ireland. Dry climate, well-drained lightish land, and large holdings with extensive hilly ranges, are the circumstances which specially favour sheep-farming.

General.—Mixed stocks, combining horse-breeding, cattle-breeding and feeding, and sheep-breeding and feeding, unquestionably pay best. Numerous holdings are not suited for such a combination; but it is generally admitted that the mixed system referred to is not practised upon nearly so many farms as it might advantageously be. This is a point which British and Irish farmers should take seriously into consideration. Separating the species, and arranging them in the order determined by the evidence before us, as to sources of profit to the farmer over the country generally, we have: 1st. *Sheep;* 2nd. *Cattle;* 3rd. *Horses.*

MAP ILLUSTRATING THE PARIS SEWAGE-IRRIGATION AT GENNEVILLIERS.



Dangerfield, lith, 22, Bedford St. Covent Garden.

II.—*The Paris Sewage Irrigation at Gennevilliers.* By F. R. DE LA TRÉHONNAIS.

[WITH A MAP.]

THE village of *Gennevilliers*, notwithstanding its close vicinity to the gay city of Paris, never was a lively spot. Its very name was scarcely known but a few years ago; and very scanty are, even now, the visitors who bend their way to its barren solitude. But the tide of progress has lately reached that lonely suburb; and what pleasure-seeking and merry throngs have done for the fame and prosperity of its near neighbour, *Asnières*, sewage has accomplished at last for *Gennevilliers.* The Paris sewers, whose turgid streams have been directed round about the all but deserted village, and made to pour their noxious filth over its sandy waste, have brought fertility to its natural barrenness, and, as if with a magic wand, changed its desert-like wilderness into luxuriant fields, teeming with verdure and plenty.

But, alas! prosperity and fame—as frequently is the wont of those two goals of human ambition—have lately brought discord and strife in their train. A recent debate in the Legislative Assembly of Versailles has divulged the existence of a serious quarrel between two parties of the inhabitants of the district, and between one of these parties and the city of Paris—the bone of contention being the disputed advantages of sewage as applied to the Gennevilliers fields and market-gardens. As the question at issue forms one of the most interesting chapters of my subject, some further reference to it will be made hereafter.

Here the question will naturally be asked, whereabouts is Gennevilliers? Before I fully enter into my sewage narrative, I think it expedient to answer that pertinent question.

Visitors to Paris have no doubt observed those remarkable meanderings of the River Seine, which occur immediately after its effluence from the city. The first bend of the stream takes place just above St. Cloud. There the river turns sharply to the right, reflecting from its clear surface, formerly the splendour, now the blackened ruins of the royal village. Retracing its course, as it were, the Seine then skirts the base of the frowning height upon which sits the fortress of Mont Valérien. Farther on, it hugs closer still the very outskirts of Paris, and soon inverts in its yet clear waters the Longchamps racecourse, and the green plantations of the Bois de Boulogne. Then come Neuilly on the right, Courbevoie and Asnières on the left bank, and then at last, not far from the line of fortifications, Clichy is reached. It is at that spot that the first outlet of the Paris sewage disgorges its black stream into the River Seine. Up to that spot the river is as clear as a mountain torrent. Its passage through the city has scarcely tainted its pellucid transparence. Confined between stately quays, spanned by a long succession of monumental bridges, uncontaminated by the outlet of any sewer, its bright stream only adds freshness and beauty to the splendour of the scene, and it issues from the city nearly as pure as it entered it.

Even at Clichy the line of the sewage remains well defined, as if the pure water of the river recoiled from the foulness of the invader. On the left bank, skirting the plain of Gennevilliers, the water preserves its purity until it reaches St. Ouen, where another outlet disgorges a new supply of sewage, and fouls the river altogether. Further on, St. Denis is reached; and there the northern sewer, together with the outflow of the Bondy *poudrette* manufactory, turn the poor river into a huge open sewer, the foulness of which is more easily imagined than described. It is at St. Denis that the apex of the first bend of the Seine is reached. At that spot, frightened, as it were, at the mass of filthiness that pollutes its waters just at that point, the river turns sharply to the left, bending its course past Argenteuil and Bezons, towards St. Germain, Poissy, &c.

The extreme end of the kind of peninsula enclosed within that first loop of the Seine is called the plain of Gennevilliers; and it is opposite Clichy, on the southern reach, and Argenteuil on the northern, that the now famous village is situated.

It would have been difficult to select a more eligible field for the disposal of the Paris sewage by absorption and cultivation than the plain of Gennevilliers. Its immediate vicinity to the principal outlets of St. Ouen, Clichy, and St. Denis, sparing the necessity of constructing any great length of costly mains, rendered it particularly adapted for the experiment of absorption. The loud and threatening complaints raised by the inhabitants on account of the foulness of the river, and the accumulation of putrid filth all along its banks, compelled the Paris municipal authorities to attempt this plan without delay. But it was not the proximity of its position alone which particularly fitted the plain of Gennevilliers for such a purpose. The porous character of its gravelly soil supplied a natural filter, both deodorising and disinfecting, whilst its utter barrenness offered an admirable field to test the fertilising powers of sewage.

The plain of Gennevilliers consists of a gravelly drift several yards in thickness; and before the contents of the Paris sewers were diverted to its surface, it was a perfect waste, chequered with pits and quarries; and scarcely any attempt had ever been made to bring any portion of it under cultivation.

Having described the position and nature of the place so happily selected by the Paris Commissioners to demonstrate the efficacy of the agricultural system for thoroughly solving the sewage problem, I will now examine the economical principles upon which that system is based, and describe, with their results, the processes resorted to by the Paris Sewage Commission. This will form, I hope, an interesting chapter in the history of sewage. An account of what has been done in this instance may be useful to other civic corporations, who are contemplating the application of the same system to the disposal of the sewage of their localities; and it is with that view, although I may fall short of my purpose, that I have attempted the task of writing this paper.

It may be said of the application of town-sewage to agriculture, that the thought of it arose more from the necessity of getting rid of a pestilential nuisance than from any want of fertilising matter felt by agricultural husbandry, or from a well-defined conviction that any great advantage would accrue therefrom to the public weal, by promoting an extra growth of crops, or improving any large extent of unproductive land.

The truth is, that so far as agriculture is generally concerned, the application of sewage is of slight interest; not, indeed, in respect to its effects on land, which, it must be admitted, are very remarkable, but from the fact that the available supply is so limited, that the extent of land that might be benefited is comparatively very narrow.

For instance, the whole of the land which the sewage of the city of Paris, however large its bulk may be, could effectually irrigate, does not exceed 12,000 acres, the produce of which, enhanced though it might be under the influence of such an irrigation, would barely provide for the food of one-fifth of the city's population.

But if the sewage question is but of small import to agriculture, it possesses a paramount interest in respect to the health of towns, and lies heavy in the responsibilities of civic corporations. The necessity of disposing of the offals of human agglomerations is a charge, the whole burden of which must exclusively fall upon the cities themselves. Agriculture is willing enough to bear a helping hand in laying out her fields for the purification of town-sewage, and is even thankful for the benefit it will undoubtedly derive from it; but the costly process through which the supply is made available to agriculture must naturally be left to the charge of municipalities, the boon to husbandry not being adequate to so large an outlay.

The great merit of the application of sewage, so far as agriculture is concerned, consists, then, in its simplicity. The fertilising stream must be brought within the immediate reach of the land, at a level that will allow its flow and self-distribution to proceed from natural gravity. It is only under such circumstances that a farmer can lend his fields to the process of irrigation, which may now be admitted to be the most effectual means that can be devised for disposing of town-sewage, without nuisance to man or beast, and with great advantage to the production of food.

This is a modern problem which has been forcibly raised in our times, in consequence of our better understanding of the hygienic economy of towns; and its solution has become an absolute necessity. The excreta of civilised communities must be effectually removed from the precincts of human dwellings; not, indeed, by relieving one spot, only more effectually to poison another, through a mere local transfer of the pestilence; for this would only spread the nuisance over an extended area, and under aggravated circumstances; but by a process of absorption, based upon the natural principle of transformation of organic matter within the soil. In that powerful chemical laboratory of Nature, sewage is not only bereft of its noxious effluvium, within the influence of which neither animal nor vegetable life can exist, but the very pestilential elements which make it a rank poison are converted into succulent food. A knowledge of that well-known chemical property of soils, than which there is no more powerful deodorising and disinfecting agent in Nature, naturally suggested to the minds of those interested in the solution of the sewage problem, to spread the contents of town-sewers over lands conveniently situated, instead of wasting their fertilising treasures into watercourses, thereby polluting rivers, destroying animal life within their bosom and vegetable life on their banks, and, moreover, fouling all the adjacent country's atmosphere, to the serious detriment of the health of its inhabitants.

It is not long since the metropolis of France has enjoyed the sanitary advantages of sewers, and even now the system is still incomplete as compared, for instance, with that of London, inasmuch as nine-tenths of the cesspool-drainage are still without any direct communication with the sewers. The remaining tenth only communicates with the sewers so far as the liquid offal is concerned, the solid being confined within vessels called *tinettes*, which, when full, are periodically removed in vehicles suited for that purpose, and replaced by empty ones. Thus the contents of nine-tenths of the Paris cesspools have to be periodically pumped up, and their contents removed to Bondy, where they undergo the process which converts them into *poudrette*, or human guano.

The *tinette* system, however, has been applied to all the newly-built houses, and is gradually extending. It consists of an iron movable double cylinder, adapted to a pipe connected with the water-closets, &c. The inner cylinder is perforated, so as to allow the liquid to escape into the sewer. Only the solid matter remains, and is taken away. With that sole exception, the sewers of Paris are well planned and substantially built; and when their communication with all the cesspools is complete, Paris will have nothing to envy, even in London, with regard to that essential hygienic institution.

The Paris sewers, in fact, have been raised to the distinction of one of the most interesting sights of the gay capital. Most illustrious strangers who visit Paris make it a point to ride in the sewers in carts, and to float down the subterranean stream in boats specially provided for that purpose; and it is a feat that can be accomplished with the greatest ease and comfort, without any risk of contamination or offensive smell.

In 1856 the total length of the Paris sewers did not exceed 160 kilometres, about 100 miles. In 1874, all branches included, they had extended to a total length of 771 kilometres, a distance equivalent to nearly 500 miles. The connection with private houses and public establishments consists of a funnel-like orifice, into which the *tinette*, above described, is fitted; and, as I have already explained, this *tinette* is connected by means of pipes with water-closets, back-kitchen sinks, and other receptacles, through which all domestic offals are got rid of, with the exception of the sweepings, ashes, and other dry refuse, which are every morning deposited before the street-doors, and removed away in dust-carts.

The streets are carefully cleansed every day with hand- and horse-brooms; and the dirt is swept into the sewers through apertures and gutters contrived under the curb-stones on each side of the streets. So it may be said of the Paris sewers that they provide infinitely better for the sewage of the streets than for that of the houses—a system which every hygienic economist must implicitly condemn, as altogether inadequate to the most elementary sanitary requirements of a town.

The sharp bend in the River Seine which I have already described was a natural advantage of no mean importance, of which the Paris Board of Works did not fail to avail themselves. This bend, by bringing land at a lower level than that of the stream in its course through Paris, within an easy distance of the city, greatly facilitated the discharge of the sewage into the river itself at Clichy, St. Ouen, and St. Denis. This local advantage enabled the engineers to dispense with the costly construction of lengthy canals across and through valuable property, the expense of which would have laid a heavy burden upon their scheme. They had, however, taken for granted that the river—which, as I have described, conveniently retraces its course so as to skirt the northern line of the fortification, and actually forms a ditch into which the sewage could be readily discharged—would remove the sewage with sufficient rapidity to avoid stagnation, and consequent fermentation and putrefaction. But the result was most disappointing and embarrassing.

The rapidity of the current of the river, which is considerable in its course through Paris, becomes greatly slackened immediately the river leaves the city, in consequence of the existence of those very meanderings. The pressure of so large an addition of foul liquid, holding in suspension a considerable amount of solid matter, impeded rather than accelerated the already sluggish flow of the river. The consequence was that a black putrescible mud was deposited by natural precipitation along the banks of the river, and in its very bed. The sewage-waters, owing to the rapidity of their underground flow, emit no smell whatever in the sewers, as may be experienced by a visit to them; but no sooner do they emerge into the river than, becoming almost stagnant, they enter at once into rapid decomposition. All the oxygen which they naturally contain, or have acquired through being agitated during their rapid outfall, is soon expended in the process of decomposition of the organic matter they contain; and the water of the river soon becomes unfit to support animal life within itself, or vegetable life in its bed, and even along its banks.

No sooner did the sewers disgorge their contents at Clichy, than the fish swam away to purer reaches, or died when they were hopelessly overtaken by the foul stream; and even the river-snails were seen to crawl out of the river. Along the banks all vestiges of vegetation disappeared; and the River Seine, so beautiful and clear up to this spot, became at once the foul and putrid cloaca of the Paris sewage, similar to that described by Livy as existing in ancient Rome, flowing into the Tiber, and known under the name of Tarquin's Cloaca; *receptaculum omnium purgamentorum urbis.*[*]

The chemical investigation which was rendered necessary by the alteration of the Seine waters through the admixture of the Paris sewage was the origin of the recognition, if not of the discovery, of this fact: that the degree of putrescible condition of water, and consequently of its unfitness to support organic life, may be expressed by its capacity to dissolve oxygen. In other words, the presence of a certain quantity of oxygen in water is indicative of its purity and fitness for domestic uses.

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[*] Hist., Lib. I. cap lvi.

In France, all hygienic chemists now employ no other method for testing the purity of water, than by ascertaining the quantity of oxygen it contains in solution, through a most simple and ready process invented by M. Gérardin, one of the hygienic inspectors of Paris.

It is a remarkable fact that sewage, or even ordinary stagnant water, after having undergone rapid decomposition when in a state of repose, recovers a condition of comparative purity, after a while, under the action of air and light. Sewage-water when enclosed in a glass jar will soon decompose, and emit bad smells, but after some time it will gradually get clear, owing to the precipitation of the solid matter which it held in suspension. One of the first tokens of this restoration of purity is the appearance of vegetable life in the shape of algæ, such as *Oscillaria viridis* and *Palmella*. After a while, the noxious smell will disappear; and limpidity and purity are restored. M. Gérardin, on being invited by the Sewer Commissioners to make microscopic and chemical analyses of the Seine water fouled by the influx of the sewage, was led to abandon the long and tedious processes of the laboratory, and try if it were not possible to test the alteration of water by means of some chemical reagent, such as permanganate of potash: a salt the use of which had often been recommended to that effect.

It was in 1856 that M. Monnier first proposed the use of permanganate of potash to test the presence of organic matter in water, relying on the property of that salt to get discoloured by substances having a great affinity for oxygen.

In practising with this reagent, M. Gérardin met with two difficulties, which led him to give it up:—First, the solution of that salt is of a light pink colour, which it was impossible to distinguish in the turgid samples of water that were to be analysed. Secondly, permanganate of potash indicates the oxidising capability of organic matter, rather than the degree of its decomposition and its influence on the condition of water.

However, the numerous experiments made with that reagent, led M. Gérardin to this important conclusion: that the discoloration of the solution of permanganate of potash was owing to its oxidising the organic matter in the water. That matter, whether in solution or suspension, has therefore more or less affinity for oxygen, and if so, it must easily absorb the oxygen dissolved in water. When water contains its normal quantity of dissolved oxygen, it may be considered pure, and capable of sustaining the life of fishes and plants. When the quantity of dissolved oxygen diminishes, fishes whose respiration is active can no longer live in such water, whilst those of a lower order, whose respiration is less active, can still exist. This is the reason why eels, for instance, will live in water so foul as to kill other fish, and leeches will thrive where even eels cannot exist. Among fresh-water shells, *Unio pictorum* will die before *Cyclas cornea* or *Bythinia impura*. *Physa fontinalis* and *Valvata piscinalis* require aerated water, whilst *Planorbis corneus* thrives in impure water.

The same rule obtains with vegetable life. Those algæ possessing a superior organisation, that is, being provided with chlorophyl, their cells being ramified and well articulated, are only found in well-aerated water; they thrive only in rapid streams, close to waterfalls and other running waters, whose surface is constantly renewed by a quick motion. Unicellular algæ, on the contrary, are found in stagnant water, which is partly deprived of its oxygen through the presence of organic matter in a state of decomposition.

From those considerations, M. Gérardin sought first to ascertain whether there existed any dissolved oxygen in waters which are notoriously foul, such, for instance, as those which issue from factories and sewers; and the result of his analyses was that no oxygen was to be found in them. Thus the conclusion which that eminent chemist came to is, that the salubrious or noxious quality of water is in direct ratio with the quantity of dissolved oxygen it contains.

A comparison between the state of the Seine water above, at, and below the influx of the sewage, will best illustrate M. Gérardin's theory.

Above Paris, the average amount of dissolved oxygen comes to 9 cubic centimetres per quart; through Paris, the average is 7; below Paris, and up to Asnières Bridge, it descends to 5·34. At St. Denis, after the whole of the sewage has been disgorged into the river, there is not a trace of oxygen; but as the stream goes down, and the sewage gets rid of its organic matter by precipitation and fermentation, oxygen reappears by degrees, viz.:—At Epinay, 1·05; at Bezons, 1·54; at Marly, 1·91; Maisons-Lafitte, 3·79; Poissy, 6·12; Mantes, 8·17; Rouen, 10·42.

The quantity of nitrogen follows the same progression, but in an inverse ratio. So in those places where most oxygen is found, there is the least nitrogen, and *vice versâ*.

It would be highly interesting, no doubt, to develop here the practical purposes to which M. Gérardin has applied his sewage-water theory, especially as regards the refuse liquids from chemical factories, distilleries, fecula mills, &c.; but it would extend this paper to an unreasonable length. Suffice it to say, that M. Gérardin has come to the conclusion that water that does not contain at least 8 cubic centimetres of dissolved oxygen per quart, is not fit for domestic uses.

The storm of angry remonstrances that arose from the dwellers on the banks of the Seine, when the sluices of the Paris sewers were opened, can be easily imagined. Numerous petitions were signed, and threats of actions against the Paris municipality freely hurled, by the inhabitants of the affected suburbs, as well as by those interested in the navigation of the Seine, the course of which soon became impeded by the deposit of black mud along its banks and in its very channel.

An idea may be formed of the extent to which the river soon became polluted by the fact of immense gaseous bubbles, several yards in diameter, rising to the surface, then bursting, and filling the atmosphere with a most offensive stench. Some of the chemists attached to the Paris Sewers Committee had the curiosity to analyse the gas which issued from these bubbles; and they found it to consist chiefly of proto-carbonate of hydrogen, burning with a blue flame.*

In the first instance, the Paris authorities, with the view of remedying, to a certain extent, the evils so justly complained of, adopted no better expedient than that of constructing huge tanks, into which the contents of the sewers were first diverted, in order that they might undergo a preliminary purifying process previous to their being poured into the river. But these tanks were soon found inadequate to the influx of the sewage.

However, the experiment was tried; and at first the precipitation of the solid matter was effected by natural gravitation taking place, when the sewage was at rest in the tanks. The comparatively clear liquid was then decanted back into the river, and the solid residue removed from the bottom of the tank, which was then immediately refilled. But this imperfect method only rendered the evil still more crying, inasmuch as no sooner was the liquid at rest, than it entered at once into active fermentation and decomposition; and the stench that arose from the tanks was most insufferable, especially in the summer months. Then purification by means of chemical action was tried. Sewage-water contains various mineral and organic matters, which impart to it an alkaline reaction, and is thus easily acted upon by chemical processes, of which these matters become themselves energetic elements. Numerous experiments were therefore made with a view to obtain more rapidly and more

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* The exact composition of that gas was as follows:—

Proto-carbonated hydrogen	72·88
Carbonic acid	12·30
Oxide of carbon	2·54
Sulphydric acid	6·70
Other substances	5·58
	100·00

effectually a precipitation of the solid matters held in solution and suspension by the sewage-water, by means of sulphate of alumina, lime, and other reagents, the use of which had been recommended in England and other countries; and to that effect new tanks were constructed on a still larger scale on the Gennevilliers side of the river.

The sulphate of alumina process seemed at first to give the most favourable results. Sulphate of alumina, after being decomposed by the alkaline elements contained in the sewage, was transformed into alumina in the form of granulated gelatine. It then merely exercised a kind of mechanical action over the solid matters suspended in the sewage, precipitating them, along with itself, to the bottom of the tank.

Under the action of that process the water was entirely clarified, and was decanted back into the river in a clear state; but it was soon found that the purification was merely mechanical, and that the water, clear and pure though it might appear, retained all its noxious characters. Sulphate of alumina acts only on the matter suspended; the water retains all the matters in solution, together with the organic elements liable to fermentation. This was clearly demonstrated by chemical analysis, as the following Table will show:—

	Sewage-water in its natural state.	Water clarified with sulphate of alumina.
	Kilog.	Kilog.
Nitrogen	0·037	0·021
Volatile and combustible matters ..	0·729	0·240
Mineral matters	2·038	0·724
	2·804	0·985

The clarified water was thus found to contain two-thirds of the nitrogen of the sewage, and one-third of the volatile and combustible matters, which are for the most part organic.

Besides this unsatisfactory result, the large amount of solid matter remained to be dealt with, after it had been removed from the bottom of the tanks. This had to be spread over a large area to undergo the necessary process of drying; and when it is considered that more than 200,000 tons would have had to be treated every year in that manner, it may be imagined what a mass of noxious gases would have arisen from such an accumulation of filth. It was, besides, calculated that the simple cost of the chemicals used would have been equal to the manuring value of the mud, and therefore its removal would have entailed an additional burden upon the ratepayers.

It seems incredible that as the contents of the cesspools and the solid matter collected in the *tinettes* are not allowed to fall into the sewers—being carefully carted away to Bondy and other places—the Paris sewage should contain so large a quantity of solid matter both in solution and in suspension. From the withdrawal of all solid excremental matter, it might be inferred, on the contrary, that very little solid matter would be found. It has been ascertained, however, that no less than 15 lbs. of suspended solid matter is contained in 1000 gallons of the Paris sewage, besides 8 lbs. in solution, giving a total of 23 lbs.

Some idea may then be formed of the extent to which the warping of the river was carried, and of the necessity, to which the municipal authorities were soon obliged to yield, of keeping steam-dredges at work along the reaches most affected by the sewage deposit.

At the outfall of St. Denis the quantity of solid matter amounts to as much as 35 lbs. per 1000 gallons; and some idea of the manuring value of the solid part of the sewage at that spot may be gathered from the following analysis:—

	lbs.
Nitrogen	1½
Combustible and soluble matter	14
Mineral matter	19½
Total solid, per 1000 gallons ..	35

No wonder that the dwellers on the banks of the river, and the navigators upon it, so loudly complained. By means of the drags, a most costly process, no less than 82,000 cubic metres of putrescent mud were removed every year; but this was only a mitigation of the evil, and by no means a cure, inasmuch as the stench emitted by the heaps of this black fatty silt, removed by the drags, was greatly increased in intensity by being exposed to the action of the air and of heat. The cost of the dragging operations came to about 7000*l.* a year.

Owing to the limited quantity of sewage hitherto utilised by the Gennevilliers people, the drags are still at work; but the still more costly and inadequate process of purification by sulphate of alumina has been altogether abandoned, to the great discomfiture of the manufacturing chemist, whose factory was close at hand, in Gennevilliers itself, and who supplied the sulphate of alumina at no small profit to himself. The supply of that chemical alone would have cost 40,000*l.* a-year, if the process had been persisted in.

In the meantime, the Sewers Commissioners, assisted by those eminent engineers, MM. Mille and Durand-Claye, were not idle in contriving other means of overcoming the huge difficulties in which the Paris sewage question was involved. During the years 1867–1868, sewage irrigation was tried on a piece of waste ground at Clichy. The sewage-water was pumped up to that piece of land and made to percolate through 3 feet of soil. A drain was provided, and the filtered water collected and carefully analysed. It was found that so much as 80 per cent. of the carbonate of ammonia was retained by the soil. Sewage, containing 43 grammes of nitrogen per ton before its application to the land, when analysed after percolation through the soil, gave scarcely any trace of it in a decomposable state. Only 1·6 gramme of nitrogen in a state of mineral ammonia could be found. It was the same with the quantity of soluble oxygen. The sewage-water, when laid on the land, scarcely contained 2 cubic centimetres of oxygen per quart. On its effluence from the soil it was found to contain from 8 to 10, which is the unerring characteristic of healthy water.

These satisfactory results, added to the success achieved in the agricultural part of the experiments, naturally pointed to the direct application of sewage to the land as the only effectual and practical means of solving the troublesome problem.

In 1869 an announcement was made that sewage would be supplied gratis to any one who felt inclined to use it on the Gennevilliers territory for agricultural or market-gardening purposes.

The response to that offer was sufficiently encouraging to induce the Commissioners to undertake at once the necessary works of delivery and distribution. To that effect, it was requisite, in the first place, to raise the sewage from the level of its outlet to a height of 11 metres, a little over 36 feet, so as to command the available area in the plain of Gennevilliers. A powerful pump, on the centrifugal principle, was first erected at Clichy. By means of this engine, the sewage is now raised so as to flow through an iron pipe which is laid underneath the footway of the Clichy bridge, and is thus carried over to the left bank of the river. Thence it is distributed all over the available space by means of open ditches, built in bricks and cement; and, owing to the high level attained, it is calculated that at least 5000 acres can be irrigated in Gennevilliers alone.

The quantity of sewage annually discharged from the Paris sewers cannot be estimated at less than 100,000,000 tons; this gives a daily average of nearly 300,000 tons.

Calculating 8000 tons as the average quantity which one acre of light gravelly soil can effectually absorb, it would require 12,500 acres to get rid of the Paris sewage; but up to the end of 1875, the owners of only 350 acres had taken advantage of the boon so graciously proffered; and even this small area is threatened to be greatly diminished, if not removed altogether.

The manufacturing chemist who supplied the sulphate of alumina has lately been moved to enter public life; and at the last election for municipal honours he managed so skilfully, that the old Corporation, who had authorised the City of Paris to lay their mains and distribution canals along the parish highways, were turned out of office, mayor and all, and the chemist was elected to the civic chair, where he now reigns supreme, surrounded by a council of his own choosing.

Who would have thought that such a matter-of-fact question as that of sewage could have arrayed in opposition to its peaceful, if not over-fragrant, sway, so powerful a champion as universal suffrage!

One of the first deeds of the new municipality was to organise a most determined attack upon the whole scheme; and one of the first steps taken was to denounce the contract which had been signed between the former Corporation and the City of Paris. Then a most vehement petition was sent to the Legislative Assembly, and it was discussed in the House at the sitting of the 18th of November last.

I will not enter into the merits of this opposition, which mainly rests on grievances having but a temporary, I might say accidental, foundation, and the *fons et origo* of which lie in motives having a personal rather than a public interest. Suffice it to say, that the complaints preferred by the new municipality chiefly referred to the excessive use of the sewage, which had the effect of flooding the cellars of the village by raising the level of the subsoil-water. This grievance, as we shall see presently, is, to a certain extent, legitimate; but as it can easily be remedied, it ought not to be alleged as a reason why the application of the system should be stopped altogether.

Unfortunately for the cause of the complainants, another petition, signed by a nearly equal number of landholders, but advocating a diametrically opposed scheme, was presented at the same time, contradicting the facts and arguments of the new Gennevilliers Corporation, and praying not only for the continuance, but for the extension of the irrigation system. Another significant fact is that not one of the landholders who are using sewage on their fields has joined the dissentients.

The Minister of Public Works, and the eminent Paris engineer, M. Krantz, had therefore no trouble in refuting the petition of the Gennevilliers Municipality; and the whole matter was referred to the Minister, who in his speech had sufficiently foreshadowed his opinion to leave very little hope of success in the minds of the worthy mayor and his sympathetic counsellors.

The total quantity of sewage that can be poured over Gennevilliers from the two outlets of Clichy and St. Ouen may be computed at 44,000 tons from each, daily; but only one-fourth of that quantity was used in 1874.

The following Table shows the progressive rate of the quantities used since the commencement:—

	Number of Acres irrigated.	Quantities used.
1869	16	650,000 Tons.
1870	55	810,000 „
1871	War and Commune.	
1872	128	1,500,000 „
1873	221	7,200,000 „
1874	289	8,000,000 „
1875	314	..

The sewage, as already stated, is pumped up at Clichy to the level of the Genevilliers' embankment by means of powerful pumping-engines of 150-horse power. From the higher level to which the sewage is pumped up, pipes, 4 feet in diameter, bring it along the Clichy Bridge to the plain. The sewage of St. Ouen, commanding a higher level, simply flows by its own gravitation through a main 2 miles in length, and directed to the extreme end of the peninsula. Both streams are then united in an open channel, built in bricks and cement, more than a mile in length, and 7 feet wide, running along the Gennevilliers and Asnières embankment. From that main, subsidiary canals of various widths and lengths, complete the distributive network.

Before we examine the agricultural results which have hitherto been obtained from the direct application of the Paris sewage to the land, it may be well to examine its chemical composition, in order to render possible a comparison with the sewage of English towns, and especially that of London.

From the fact I have already stated, that the solid excrementitious matter is not allowed to pass into the sewers, it may be inferred at once that a notable difference may be expected between the sewage of both cities, especially as regards its manuring value.

This difference exists to a remarkable degree between the Clichy and the St. Denis sewage-waters. At the latter place, where the great northern main discharges its contents, the refuse of the Bondy *poudrette* manufactory falls into the sewer, and the numerous manure-works of that neighbourhood send their contingent to the sewage; and the consequence is that a much larger quantity of nitrogen and combustible organic matter is found in the sewage at that spot than at Clichy.

The sewage-water issuing at the latter outlet and at St. Denis respectively contain per ton:—

	Clichy.	St. Denis.
	Grains.	Grains.
Nitrogen	61·73	2,160·55
Combustible or volatile organic matter	10,185·45	21,296·85
Mineral matter	21,605·50	29,939·05
	31,852·68	53,396·45

When the whole irrigation system is complete, and all the sewage from the three outlets, is made to flow into one single channel, which will convey it in a flood over the proposed area, of sufficient extent to absorb one hundred million tons of sewage per annum, the average sewage will thus convey to the land no less than 200 grains of fertilising matter per gallon.

As I have already stated, no better soil could have been selected to test the efficiency of the agricultural system, with the view of getting rid of the sewage nuisance, than the plain of Gennevilliers. Its immediate vicinity to the outlets, which saved the necessity of constructing any great length of costly mains; its low level, which allowed the distribution of the sewage by gravitation, once it was raised up to the level of the river embankment; the great depth of its gravelly subsoil, through which the water easily percolates to the water-bearing stratum, the level of which, from its direct communication with the river, never rises above it, except in case of great floods, when the natural drainage is taxed beyond its power of discharge;—all these advantages and favourable circumstances, could not fail to help the experiment to a highly successful issue. As might have been expected, the water, after percolating through the gravelly soil, was found at its effluence into the river in as great a state of purity as could be desired. The soil acts as a natural filter of great power, through which the water becomes easily aerated and oxygenised.

To those favourable elements must be added the utterly barren nature of the tract of waste land comprising the plain of Gennevilliers, to which, however, its proximity to the capital would give a very high value, if it could only be made productive. This transformation, sewage alone could accomplish; and market-gardeners, nurserymen, and agriculturists, were not slow in accepting the proffered boon.

Unfortunately the available area is by no means adequate to receive the quantity of sewage which, sooner or later, must be diverted from the river; and one of the legitimate causes of complaint alleged by the adverse petitioners, was the excess of flooding with sewage to which the Paris Commissioners were tempted, in their anxiety to get rid of their commodity. Flushed by their manifest success, they thought that the capacity of the land to absorb the sewage had no limits; and we find that in the year 1874 some of the fields were favoured with no less than 40,000 tons of the liquor per acre. No wonder that the level of the water-bearing stratum was so raised as to flood some low-lying cellars, and the bottoms of old gravel-pits. This was not irrigating the land, but flooding it with a vengeance.

The Paris engineers had calculated that each acre could easily and profitably absorb some 82,000 gallons of sewage, calculating upon three crops a year, and a flood of 27,000 gallons for each crop. This is evidently excessive, for it would amount to the drainage of 360 inhabitants per acre; whereas in England the drainage of 200 inhabitants is, I believe, found by practice to be the maximum that can be absorbed by an acre of land under active cultivation. On the sewage-farm at Croydon, the sewage from 165 inhabitants only is used for one acre. It must be admitted, however, that the same rule does not obtain for all soils and climates. It is obvious that the hot and dry plain of Gennevilliers, especially during the summer season, can absorb a much larger quantity of sewage than any part of moist England. At all events, it plainly appears that the policy aimed at by the Paris Sewage Commissioners was not so much to promote the proper growth of vegetable market-commodities, as to get rid of the largest possible quantity of their sewage; and however little sympathy may be felt for the petitioners, it must be admitted that through the lavish supply of sewage, they had some reason to complain.

The plain of Gennevilliers lies at the base of the high ground of the Mont Valérien and Buzenval districts, and receives all the rain that falls on that extensive watershed; and although its alluvial gravel measures, in places, from 25 to 45 feet in depth, yet when, in addition to natural drainage arising from the rainfall, it receives a dose of 40,000 tons of liquid in the course of a year, its absorbing capacity is evidently overtaxed, and the evils complained of are the result.

Even in winter, when, the crops being all removed, the land remains idle, the sewage is nevertheless poured over the naked surface, leaving a black deposit intended to warp the soil and increase the depth of its crop-bearing stratum for the ensuing season. This is evidently wrong in practice. It has been demonstrated in England that, together with the soil, vegetation is a most energetic deodorising and purifying agent, by assimilating under some form or other, whether organic or mineral, all the fertilising matter contained in the sewage; therefore, if the purifying process by vegetable absorption be left out, and that duty exclusively apportioned to the action of the soil, at a time when it is saturated with the winter rainfall, it is obvious that failure must be the result. There can be no doubt that the comparative break-down of the system, as applied to Gennevilliers, must be ascribed to that cause, and that the adverse petition to the Legislative Assembly by some of the inhabitants rests upon some legitimate foundation.

So far as agriculture is concerned, there is no gainsaying the fact that extraordinary success has been achieved at Gennevilliers. The principal crops grown under sewage-irrigation naturally belong more especially to market- and nursery-gardening than to ordinary farm-culture; but it may be asserted that in no instance of sewage-irrigation has the application of the system been attended with greater success.

Last year a Committee was appointed by the Central Agricultural Society of France, at the request of the civic authorities, to examine the various plots of ground under sewage-treatment, with the view to determine the merits of the respective occupiers, and award prizes accordingly.

The first prize, consisting of a work of art, was presented to M. Jolliclerc, whose plot of 20 acres deserves a special notice, owing to the great skill displayed in its management, and the systematic care with which all the operations connected with the application of sewage, in season and out of season, are carried out upon it.

It was about the close of the year 1869 that M. Jolliclerc took a lease of about 20 acres of ground, which had been utterly abandoned owing to its barren nature. It was only in the month of June 1870, that sewage could be brought to it, so extensive had been the preparatory works of levelling the land for the proper distribution of the sewage and the construction of the canal connected with the main. Seeds of various vegetables, suited to the Paris market, were then sown, and the first crops were so abundant and so beautiful, that M. Jolliclerc succeeded in obtaining most favourable contracts to supply the 'Grand Hôtel,' several hospitals, barracks, and other large establishments in the metropolis.

The unfortunate events of the year 1870 and 1871 interrupted M. Jolliclerc's cultivation; but at the termination of the *Commune* Civil War, his operations were actively resumed, and a visit to his sewage market-garden will amply repay the trouble of the journey. It is, indeed, difficult to imagine a more interesting picture of active and luxuriant vegetation.

Artichokes, beetroots, carrots, cabbages of all kinds, cucumbers, melons, bulbous chervil, spinach, strawberries, beans, turnips, onions, parsnips, leeks, green-peas, potatoes, pumpkins, tomatoes, &c.—in fact, all the vegetables known to the Paris climate are cultivated in turn, each according to its proper season, with a success which, as regards size, flavour, and abundance, has never been equalled in the neighbourhood of the capital.

Having an unlimited supply of rich sewage at his command, M. Jolliclerc never allows his ground to remain fallow, except in the depth of winter, which, in that low and porous district, is always of exceessive rigour.

The land is dug up with the spade and laid out in beds, about 2 feet 6 inches in width. Each stetch is divided by a channel of equal width, which the sewage is allowed to flood after each crop, and in summer, several times, whenever the land gets dry.

After each crop, the order of the stetches is inverted, the new bed intended to receive the fresh crop being raised where the former sewage-channel was laid. By means of this alternate rotation, half the space remains in bare fallow, and thus gets fertilised both from actual rest and direct absorption of sewage-water, whilst the crop growing on the adjacent bed derives from the right and from the left, all the moisture and nutrition it requires for its rapid growth and development.

With this judicious system, it will be seen that the growing plants have no direct communication with the sewage, and no contact whatever with it, even through the leaves.

Taking into consideration the barren nature of the ground where M. Joliclerc has laid out his market-garden, the bulk of the crops he obtains is considerable. The average quantities of various produce harvested from this sewage market-garden being as follows per acre:—carrots, 20 tons; red beet-roots for salad, 35 tons; French beans, 6 tons; cabbages, 30 tons; spinach, 4 tons; artichokes, about 40,000 heads.

From 20 acres he had under cultivation at the outset of his operations in 1869, M. Jolliclerc has now increased his holding to 300 acres, and is making arrangements to further increase it to 1000 acres.

Besides market-gardening, there are also regular farming operations carried out at Gennevilliers under the sewage-system. From ground of the same description as that of M. Jolliclerc, M. Boismal succeeded in harvesting, in 1874, 50 tons of excellent mangolds, 32 bushels of wheat, and 56 bushels of oats per acre.

Industrial crops of unusual bulk and quality have also been obtained from highly successful experiments. M. Auguste Royer has obtained 31 tons of mint out of 5 acres of irrigated land, of a value equal to 40*l.* per acre. Asparagus and potatoes grow also most luxuriantly and profitably. M. Tholomier took some old quarry-ground, measuring about 3½ acres, at a rental of 6*l.* in all, from which he has obtained an annual produce exceeding 160*l.* in value.

Nursery- and flower-gardening are also carried on most successfully at Gennevilliers under the sewage system. All visitors to Paris are pleasantly struck with the beautiful display of cut and pot flowers gracing numerous open-air markets and shops all over the French capital. In fact, the flower-trade is one of great and still growing importance; and the area of land devoted to that beautiful culture is greatly extending every year in the immediate neighbourhood of Paris. Several well-known nurserymen and flower-growers have recently established gardens at Gennevilliers, specially devoted to that industry under the sewage-system; and nothing can give an idea of the peculiar and extraordinary brilliancy of colour and fragrance of perfume pertaining to the various flowers grown from those sewage-irrigated beds.

The growth of fruit-trees has also been attempted with wonderful success in point of rapidity of development in the trees, and the excellence and size of the fruit produced.

Familiar as my English readers are with the good effects of the application of sewage in England, I doubt if they would be prepared to realise the wonderful results of that system under the Paris climate, and upon the sandy soil of the Gennevilliers plains, unless they saw it, and came to consider the local circumstances which give to the application of sewage unusually favourable conditions.

In the first place, the porous nature of the soil readily drains from the seed-bed the excess of moisture arising from an over-abundant flooding of sewage; and, secondly, the large amount of caloric which readily accumulates in the gravelly subsoil from the exposure of the surface to the hot Paris sun during the summer season, acts as bottom heat; and it is easy to imagine what energetic activity sewage-irrigation, under such climatic influences, must impart to vegetation.

Already, as a natural consequence of the successful results, the rent-value of the land susceptible of being irrigated has risen considerably. Land which formerly could hardly command 20*s.* an acre, is now readily let at 6*l.* 10*s.* The Municipality of Paris get now as much as 8*l.* an acre for the land they possess in Gennevilliers, and the rate is still increasing.

As another consequence of that prosperous state of the district, population is rapidly increasing, labour being in great demand, owing to the extensive market-gardens established upon every available spot of land within reach of the sewage.

New dwellings are being erected, and quite a new village, called *Les Gresillons*, has lately sprung up near the Clichy Bridge, and is chiefly inhabited by market-gardeners.

Under these circumstances, it is but natural to find that the Paris municipal authorities, disregarding the petty opposition raised against the very existence of their scheme at Gennevilliers by a small knot of discontented or disappointed people, are pushing on their plans for the extension of their works of distribution, so as to dispose of the whole of the sewage. To that effect, they have applied for a declaration from the State that the scheme they have now selected to dispose of the Paris sewage through its absorption by the soil, is of *utilité publique:* a declaration which is equivalent to an Act of Parliament, authorising appropriations, and granting of all the powers, necessary to carry on works without any fear of individual opposition.

The land available at Gennevilliers and Asnières not being sufficient to absorb all the sewage, it is now intended to cross the river again at St. Germain, and irrigate all the land lying on the verge of the forest along the river, and if need be, pour whatever is not used for agricultural purposes into the forest itself.

This seems to be the only practical way of dealing with the serious difficulties in which the question is involved; and, from the pressing necessity of the solution of the problem, in that way and in no other, it must at last prevail.

The late lamented M. Ducuing had prepared a scheme to take the Paris sewage to the sea at Havre, along the course of the river Seine, thus repeating the scheme recommended of old by Ovid.

"Dorice ab Iliaca placidus purgamina Vesta,
Detulerit flavis in Mare Tibris aquis."

But, on examination, that scheme was found impracticable, not only on account of the enormous expenditure of capital it would entail, but also on account of its engineering impossibilities.

Such is the position of the sewage question in Paris. From what I have said, it may be fairly concluded that the happy solution of the grave difficulties in which the Paris Corporation found themselves involved when it turned out, against their fond expectation, that the River Seine did not remove the sewage along with its stream, but got helplessly fouled and poisoned, has at last reached a point beyond the stage of groping experiments. The issue is now close at hand, and there cannot be any apprehension about its successful and satisfactory character, when we consider, on the one hand, the crushing urgency of the want and the completeness of the remedy, and on the other the irresistible power wielded by the great city's corporation, which has determined to adopt that remedy.

III.—*The Agricultural Holdings (England) Act*, 1875. By FREDERICK CLIFFORD, of the Middle Temple, Barrister-at-Law.

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INTRODUCTION.

THE object of this Paper is not to discuss the policy of the Agricultural Holdings Act, nor yet to criticise its shortcomings from the point of view of landlord or tenant, but to give such an explanation of its provisions as will be intelligible to those whom it so intimately concerns. On the whole, considering the number of amendments made in the original Bill, and the late period of the Session to which the discussions in Committee were protracted, the Act bears fewer marks of haste and cobbled legislation than might have been expected. Its leading principles are well defined; and though the language of particular sections is not always free from doubt, the Act, considered from the draughtsman's point of view, is an extremely creditable piece of workmanship. However small, too, may be its immediate effect upon the relations of landlord and tenant, through its permissive character, no lawyer can undervalue an Act of Parliament which reverses a presumption of law in existence for centuries past, and reverses it apparently in favour of the husbandman and against the lord, but really in the interest of both these classes.

The law is said to be the perfection of common sense. It is also, or should be, the perfection of justice; and this perfection is not fixed, absolute, and unchangeable, but must vary with custom, and be fashioned from time to time according to the altered circumstances of society; otherwise, the legal perfection of one age may be the imperfection of the next. Thus when husbandry was rude, and as an art could hardly be said to exist, there was no great hardship in a rule[*] which secured to the husbandman, with certain limitations, the crops of the year, but gave him no farther rights in the soil. The year's crops would represent pretty accurately the return to which he was entitled for his industry; unexhausted improvements would be to him words without meaning. As capital and skill, however, came to be imported into agriculture, there arose the necessity of affording the cultivator of the soil some further protection than that which sufficed when labour and seed, with the poor manure of the farmyard, were his chief if not his only investment in the soil. Then Custom gradually arose, and became an ally of the English Law, varying in different counties, and even in different districts in the same county, but recognising, though still partially and inadequately as a whole, the just rights of the farmer, newly created as these were by a more elaborate and artificial system of cultivation.

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[*] The rule as to Emblements.

The growth of these local customs is in itself an interesting example of the mode in which custom and law, working together in this country, combine to recognise great social changes long before their recognition by the Legislature, and to soften in practice the application of what has come to be a rigorous and inequitable principle of law. "It is somewhat remarkable," says one writer,* "that the Lincolnshire custom itself, from which the main features of the Act are borrowed, followed and did not precede the great agricultural improvements made in that county." But in truth, there is nothing remarkable in this order of events: cause and effect have borne here their usual relation to each other. What is more remarkable is the power of adaptation to special circumstances shown by the English common law, and the force slowly attained by custom when sanctioned by the law, and felt to be in itself just and expedient.† It has always been in the power of landlords in Lincolnshire and elsewhere to contract themselves out of any local custom, just as it is now in the power of landlords anywhere to contract themselves out of the Agricultural Holdings Act. But custom rules, nevertheless; and though at one time it must have been new to English judges, it was engrafted by them in time upon the common law. They went even farther; not only enforcing these local customs in agriculture in the absence of agreement, but even giving to tenants the benefit of these customs in cases where an agreement had been entered into, provided the agreement contained nothing inconsistent with the custom.

Under the Common Law of England, agricultural tenants have enjoyed from remote antiquity a certain degree of protection. It is true that the leaning of the law was far more strongly pronounced in favour of ownership. Following in this respect the Roman law, our early English commentators laid down the doctrine not only that buildings passed with the soil, but that, if trees were planted or seed sown in another's land, the proprietor of the soil became proprietor also of the tree, the plant, or the seed, as soon as it had taken root. *Quicquid plantatur solo, solo cedit*—whatever is affixed to soil becomes, in contemplation of law, a part of the soil, and subject to the same rights of property as the soil itself. When farmers were little more than bailiffs or stewards, paying a rent in kind, this general doctrine was not so harsh and unjust as it now seems to us under the highly artificial conditions of modern agricultural tenancies. The maxim, however, was in time tempered in favour of the tenant, as well from a sense of justice as for reasons of public policy. "If the tenant-at-will sows his land," says Blackstone, "and the landlord, before the corn is ripe or before it is reaped, puts him out, yet the tenant shall have the emblements, and free ingress, egress, and regress, to cut and carry away the profits. And this for the same reason upon which all the cases of emblements turn, viz., the point of uncertainty; since the tenant could not possibly know when his landlord would determine his holding, and therefore could make no provision against it; and having sown the land, which is for the good of the public, upon a reasonable presumption, the law will not suffer him to be a loser by it." And again: "The tenant . . . shall have the emblements to compensate for the labour and expense of tilling, manuring, and sowing the lands, and also for the encouragement of husbandry, which, being a public benefit, tending to the increase and plenty of provisions, ought to have the utmost security and privilege that the law can give it. Wherefore, by feudal law, if the tenant for life died between the beginning of September and the end of February, the lord who was entitled to the reversion was also entitled to the profits of the whole year; but if he died between the beginning of March and the end of August, the heirs of the tenant received the whole. And from hence our law of emblements seems to have been derived."

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* 'Quarterly Review,' vol. 139, p. 562.

† But the law of change applies with equal force to custom as to law. "Customs," says Lord Henniker, "are no longer applicable to many places where they exist, and it will be a boon that a good sound rule should be laid down, having all the force of legislative enactment. A good measure laid down upon broad lines will be pretty generally followed."—(Speech on Second Reading of Agricultural Holdings Bill, House of Lords, March 12, 1875).

The doctrine of emblements,* as Blackstone elsewhere explains, extended only to corn sown, roots planted, or other

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* Emblements (sometimes called *fructus industriales*) is derived from the old French term *emblavence de blé*, corn sprung up above ground, and the word strictly means growing crops of sown land, but was enlarged to mean roots planted, and other annual artificial profits derived from the soil. The importance of the old doctrine has been shorn by 14 & 15 Vict. c. 25, which recites "the evils of the right to emblements," and provides (§ 1) that, instead of this right, tenants in certain cases, where their leases or tenancies are determined by the death of the limited owner, shall continue to occupy their holdings till the end of the current year of their respective tenancies.

"annual artificial profit. It is otherwise of fruit-trees, grass, and the like, which are not planted annually at the expense and labour of the tenant, but are either a permanent or natural profit of the earth; for when a man plants a tree, he cannot be presumed to plant it in contemplation of any present profit, but merely with a prospect of its being useful to himself in future, and to a future succession of tenants." Thus the law did not recognise the tenant's right to do more than was necessary to raise one year's crop. He might live, or farm, from hand to mouth; but if he planted, or built, or treated the soil with a view to future benefit, he did so at his own risk, and must trust to the generosity of the owner. And the strongest testimony we can have to show that the ancient trust thus reposed by English tenants in English landlords was not on the whole misplaced, is the fact that statutory compensation for unexhausted improvements could have been so long delayed. If any considerable number of the owners of the soil had stood on their strict rights, and taken such advantage of tenants' improvements as was permitted them by a too rigorous law, that law would have been swept away years ago amidst heart-burnings and indignation which would have survived for generations.

It was felt at length—and not too soon—that the new class of interests which had sprung up in the soil should not be left dependent on the good feeling and forbearance of any class, however disposed they might be to do substantial justice between themselves and the persons who had created these interests. There was a time, as we have seen, when the maxim that whatever is annexed to the soil belongs to the owner of the soil, was not necessarily harsh or inapplicable. Then came the doctrine of emblements, the first legal recognition of tenant-right, a rough but probably on the whole a satisfactory solution of the difficulty as it then existed; and this doctrine was followed by the judge-made law which adopted and confirmed local custom, in defence of the undoubted personal interests of tenants and in furtherance of public policy. Next in order come the attempts made in 1843 by Lord Portman, in the Upper House, and in 1847–9 by Mr. Philip Pusey,* in the House of Commons, to supplement by a general law that which had become of partial application in English agriculture by force of custom.

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* Readers of the 'Journal' will be glad to be reminded of the Prime Minister's eulogium:—"Mr. Pusey, who was, both by his lineage, his estate, his rare accomplishments, and fine abilities, one of the most distinguished country gentlemen who ever sat in the House of Commons."—(Speech of Mr. Disraeli in moving the Second Reading of Agricultural Holdings Bill, June 24, 1875). Mr. Pusey told the present First Minister, that the fact that a tenant-at-will had no security for the capital which he ought to be encouraged to invest in the soil, was "the only blot in the agricultural hierarchy." But Mr. Pusey, while a vigorous supporter of tenant-right, was an opponent of leases, which, in his opinion, would lead to the breaking-up of estates, and destroy the influence of landlords.

These labours were not without fruit, though Parliament appointed Committees in vain, and elaborate investigations and prolonged discussions, in and out of Parliament, seemed at one time only to disclose new difficulties and to disappoint the hope of finding any common ground of agreement. During the thirty odd years which have since passed, English farming has come to require more scientific training, with far greater capital and appliances; and the arguments of Mr. Pusey and his friends have been reinforced, and the case for legislation has been greatly strengthened, by a plain and growing necessity. It is not necessary to trace here, in any detail, the history of what can hardly be called an agitation for a change in the law. The Agricultural Holdings (England) Act, 1875, was a concession to demands which had long been made on the part of the tenant-farmers; but it was not the result of agitation or strong excitement. Accordingly, its provisions are moderate, and to many persons may be disappointing from their moderation. But though nobody need come under the Act who wishes to avoid it, we may not unfairly presume that in course of years it will do for England, as a whole, what habit and repute as to farm-improvements have already done in Lincolnshire and other counties; for the force of law will now always be working, silently but not ineffectually, to replace bad customs by reasonable ones, and to establish these reasonable customs in the tenant's favour when none others exist.

In examining the provisions of the Act it will be convenient to follow its main divisions, though not always the order in which these are placed; and we may begin with the

GENERAL APPLICATION OF THE ACT.

The Irish farmers possess their own charter in the Act of 1870, "to amend the law relating to the occupation and ownership of land in Ireland." The Scotch farmers, it is to be presumed, will be dealt with in their turn. The Act of 1875, therefore, does not apply to either Scotland or Ireland (§ 3). The Irish Act, it may be remembered, contains a scheme, based no doubt on the supposed wants of the country, enabling the Board of Public Works in Ireland to make advances to landlords of sums due to tenants as compensation in cases in which the tenants quit their holdings of their own accord, without being disturbed by the landlords. It also empowers the Board to make advances to landlords for the improvement of waste lands. Above all, the Act authorises the Board, if they are satisfied with the security, to advance to any tenant a sum not exceeding two-thirds of the purchase-money for the purpose of enabling him to buy the freehold. Under § 47, entire estates may be bought by the tenantry with the help of State loans, provided that tenants representing four-fifths in value of the estate concur in a desire to purchase it, in which case outside purchasers may come in, and the Board will advance one-half of their purchase-money, with two-thirds of the purchase-money of the tenantry.

Freedom of Contract.—It is hardly necessary to say that none of these provisions find a place in the English Act, which is restricted to its one object of adding to the security of farming capital by affording a reasonable compensation to tenants for such capital when sunk in the land and still remaining to the benefit of the land, always provided that no agreement exists to the contrary. The foundation of the Act is its recognition of the perfect competency of tenants as well as landlords to manage their own affairs and make their own bargains. If they think fit to exclude the operation of the Act altogether, they are free to do so, and each may, as heretofore, make the best terms he can for himself, or lay down the conditions which in his opinion best meet his own case. If the tenant chooses to forego all claims to compensation, he may do so; if, on the contrary, he exacts more liberal compensation than any which the Act allows, and the landlord assents, they have nothing to do but to embody the precise terms in an agreement. They may contract themselves entirely out of the Act in either case, for nothing in the Act will prevent a landlord and tenant, or persons contemplating this relation, from making any agreement they think fit, or will interfere with the operation of such agreement (§ 54).

Adoption of parts of the Act.—On the other hand, they may agree (but the agreement must be in writing) to adopt any parts of the Act they may think suitable to their case, excluding the remaining parts (§ 55). This is a most useful provision. For example, a landlord may distrust the working of the Act with regard to compensation, or the tenant may prefer to claim under custom instead of under the Act; but both may agree in either of these contingencies to adopt the sections of the Act which provide for the settlement of disputes between them, or as to the amount of compensation due, or such of the sections as apply to the particular case. Again: the provision which recognises a landlord's title to meet the tenant's claim to compensation by a counter-claim,* for waste or breach of covenant (§ 19) is very likely to form part of future agreements, for at present the enforcement of any such counter-claims by action at law is difficult and costly, whereas the Act provides an easy and summary mode of doing so. The tenant may insist upon the extended notice to quit provided by the Act (§ 51), or upon the section recognising his property in fixtures, machinery, &c. (§ 53); and the landlord may find it useful, in view of contemplated changes in his property, to adopt the section enabling him to resume part of the holding for one or more of the purposes specified in § 52. All or any of these provisions may be adopted "by reference," that is, the sections so adopted need not be set out at length but need only be referred to, just as, in a private Act of Parliament, general Acts, or parts of general Acts are often incorporated by reference. Taking such an "incorporation of Acts clause" as a model, the agreement might run in this form:

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* It seems unfortunate for the landlord that he can only put in a counter-claim, where the tenant has made a claim for improvements under this Act. In many cases where there is a claim for away-going crop, or acts of husbandry, it would be well if the landlord's claim for waste and dilapidation could be put in and determined by arbitration.—*Note by Mr. J. D. Dent, of Ribston Hall, Wetherby.*

"For the purposes of this agreement the following provisions of the Agricultural Holdings (England) Act 1875 are adopted herewith, viz.:—

Sections 20 to 41 inclusive (relating to procedure).
Section 51. (Time of notice to quit.)
Section 52. (Resumption of improvements.)
Section 53. (As to fixtures.)

Or such part of the above sections as are not inconsistent with this agreement."

Another provision in the Act, if adopted in farm agreements, will be found very valuable. I refer to § 42, which enables limited owners, by an easy method, to charge the holding with the amount of any compensation due to tenants. At present one great obstacle to security for the tenant's expenditure is the inability of limited owners to give the requisite guarantee or, with justice to their families, to pay the sum fairly due as compensation to tenants. As the greater part of the land throughout the United Kingdom is held by limited owners, the want of some simple method of enabling them to charge the inheritance has long been felt. No doubt limited owners, with the consent of the Inclosure Commissioners, may already obtain these charges through the Court of Chancery, and by means of the Improvement of Land Act, 1864, and the Lands' Improvement Companies, but with a trouble and expense which have hitherto often deterred them from making use of this cumbrous machinery. It has now been the object of the Legislature, subject to restrictions which will be noticed hereafter, to give both to absolute and limited owners a cheap and easy method of charging their estates with the amount of compensation due under any circumstances, whether by force of custom, or under the Act, or by virtue of a special agreement. This intention might have been more clearly expressed, for although a landlord and tenant (§ 55) may agree to adopt "any of the provisions" of the Act, and thereupon any provision so adopted is to "have effect in the agreement accordingly," it may be argued that § 42 only authorises a charge upon the estate for the amount of compensation due to a tenant "under this Act," and the Court is only to allow the charge "on being satisfied of the observance in good faith by the parties of the conditions imposed by this Act," whereas the compensation would be really due to the tenant, not under the Act but under the agreement, or by the custom; and the parties to the agreement would be outside the conditions of the Act, except those contained in and imposed by the incorporated section. However, the language of the sub-section (§ 55) shows that the Legislature specially contemplated the adoption of the estate-charging clause by limited owners who did not desire to come under the Act generally, and it may be assumed that the Courts would interpret the two sections so as to carry out the obvious meaning of the Legislature.*

Non-application to Small Holdings.—We may now consider in what cases the Act will and will not apply. It will not apply to holdings which are non-agricultural, or which are smaller in extent than two acres (§ 58). There was an attempt in the House of Commons to extend the Act to the case of allotments, or plots of land let to farm-labourers; and it was argued that they put into the soil even a larger proportion of capital, represented by labour, in proportion to the extent of land they cultivate, than the tenant-farmers. But the practical inconveniences of recognising a tenant-right in this class of small cultivators led the House to reject this proposal; and here, as in other cases, the maxim still prevails—*De minimis non curat lex*.

The Act came into operation on February 14, 1876, and thereafter will apply to all new, and to some then-existing holdings of agricultural or pastoral lands, or lands partly agricultural and partly pastoral, over two acres in extent (§ 58), subject to the following limitations:—

As to New Tenancies.—It will apply to all holdings—whether tenancies at will, or from year to year, or for a term, or for lives—beginning after February 14, unless the landlord or his agent take the precaution of having a written agreement, signed by the tenant as well as by the landlord or agent, expressly contracting themselves out of the Act (§ 56). If, therefore, in entering into a new contract of tenancy, the parties desire to be governed by the Act in every particular not provided for by the special agreement, this result will be obtained by implication, though the Act may not once be mentioned. It is obviously necessary, therefore, in drawing up such agreements, to bear in mind that if they are silent as to the operation of the Act, they may be subjected to important variations and additions, in the terms of the Act, so far as these are not over-ridden by the terms of the agreements. Any such agreements must expressly provide that the Act, and no part or provision of the Act, shall apply (§ 56). The Act is permissive only in the sense that, if parties to a contract of tenancy take certain simple precautions to escape from its operation they are free to do so. But it is not enough to say by word of mouth that they do not want to be governed by its provisions. They must put this intention in writing, either in the lease or agreement itself, or in a separate form, for unless this precaution be taken the Act becomes operative. If the intention be to exclude the operation of the entire Act, this intention may be easily expressed by a proviso in the agreement, following the words of § 56:—

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* This, however, could not be made to apply to any work executed by a landlord, at his own expense, for the convenience of his tenant.—*Note by Mr. J. D Dent.*

"Provided always, and it is hereby agreed and declared by and between the parties hereto, that the Agricultural Holdings (England) Act, 1875, or any part or provision thereof, shall not apply to the contract hereby entered into."

Some such clause will, no doubt, for some time after the Act has been in operation, form part of many future agreements in the interests of the landlord. On the other hand, if the tenant desires to secure the benefit of the Act, he must be careful to see that his lease or agreement contains no clause of this kind. If the landlord and tenant decide upon incorporating in the new agreement any "part or provision" of the Act, without adopting the whole of it, such part or provision must be clearly specified in the mode already indicated. It may not be superfluous to explain that the words, "Part or provision"—the words used in § 56—have two different meanings. "Part" includes all the sections under any one of the general headings in the Act. For instance, the sections relating to "Compensation," "Procedure," "Charge of Tenants' Compensation," "Fixtures," &c., are all respectively so comprised; and a proviso that the parties agreeing to adopt "that part of the Act relating to Fixtures" would by reference be a sufficient adoption of the various sections contained in such Part. "Provision" may mean, by contradistinction, one of the sections possibly forming a "part" in itself, as § 51, "Notice to Quit," and § 52, "Resumption for Improvements."

As to Tenancies existing before February 14, 1876 (§ 57).—The Act will apply to no existing tenancies under lease or agreement for years, or for life (§ 57, sub-sect.); but it will take effect upon all existing tenancies from year to year, or at will, unless "within two months after the commencement of the Act"—that is, on or before April 13, 1876 (April 14 being Good Friday, and a *dies non*)—the landlord or the tenant gives notice in writing to the other that he desires that the existing tenure shall remain unaffected by the Act (§ 57). Thus silence, as in the case of new tenancies, will be taken as meaning consent to the adoption of the Act. On the other hand, either party has the option of excluding the operation of the Act; but, again, it must not be by word of mouth, but by writing. If on either side such a notice has been given, in distrust of the Act, or *ex abundante cautelâ*, the notice may at any time during the tenancy be revoked, and thereupon the Act will apply; or at any time parts of the Act may be adopted, as has already been explained. No express form of words is necessary in this or other cases of notice under the Act, but this simple form may be given for guidance:—

"SIR,—Pursuant to the provisions of the Agricultural Holdings (England) Act, 1875, I hereby give you notice that I desire that the existing contract of tenancy between [*us*] shall remain unaffected by the said Act.

"Dated the day of , 18 ."

Such a notice would be signed by the landlord or the tenant who gave the notice. If given by the latter to the agent, the word within brackets might be replaced by the words "between [*name of landlord*] and myself;" if given by the agent to the tenant, the appropriate words would be "between [*name of landlord*] and yourself." Though landlords will doubtless take the initiative in most cases, it is important that yearly tenants or tenants-at-will should also know their position under the Act—what they are required to do, and what will be the result if they do nothing. It must be borne in mind that a tenant may claim compensation either under the Act, if it applies to his holding, *or* under custom or contract; he must only not claim under the Act, *and* under custom or contract, "in respect of the same work or thing" (§ 59). The compensation due to him under the custom of the country may be more beneficial to him than any compensation which would accrue under the Act; and it may therefore be to his injury if he stands by—being a yearly tenant or tenant-at-will—and, through negligence or ignorance, allows the time to expire within which he may prevent the Act from applying. In the event of such a lapse on either side, the Act, having once taken effect, can only be ousted by mutual consent or by determination of the tenancy. While the operation of the Act may be excluded by either landlord or tenant, both must concur in order to adopt parts of the Act, as this must necessarily be in writing.

An important question arises under § 57. Where a tenant from year to year holds under an agreement, how is the agreement affected by the Act, in the absence of notice to exclude the operation of the Act? The point is not free from doubt, but the reasonable construction seems to be that, in the case of a current tenancy from year to year, the existence of an agreement will not prevent the Act from applying; while, on the other hand, the Act will not override the agreement, but will supplement it, and be read as one with it. It is true that § 54 says that nothing in the Act shall "interfere with the operation" of an agreement. But the language of § 57 is equally express in its application to existing "contracts of tenancies" from year to year, thereby including yearly tenancies under written agreement, as well as those where there is no agreement. Such an application of § 57 will not "interfere with the operation" of any agreement in the sense of contravening it. The contract of tenancy will be "affected" by the Act, not revoked. In other words, where the agreement expresses the will of the parties, it will prevail over the Act, thereby preserving the freedom of contract, which is the spirit of the Act; but where the agreement is silent, the Act will step in, just as the custom of the country may be imported into any farm agreement with which it is not inconsistent. If this view be correct, it follows that where either of the parties to an existing tenancy from year to year desires that the Act shall not be incorporated with the agreement, he must give notice, in the terms of § 57, "that he desires that the existing contract of tenancy between them shall remain unaffected by the Act." Neither landlord nor tenant will be safe in relying upon the agreement without such notice.

General Saving of Rights (§ 60).—The Act leaves untouched, except as therein expressed, any power, right, or remedy vested in a landlord, tenant, or other person, by statute, custom, or otherwise, "in respect of a contract of tenancy or other contract, or of any improvement, waste, emblements, tillages, away-going crops, fixtures, tax, rate, tithe-rentcharge, rent, or other thing."

SUBJECTS OF COMPENSATION.

Having ascertained the cases in which the Act applies, or may apply, we may now examine the provisions of the Act which regulate a tenant's title to compensation for improvements executed on his holding. Here it is proper to bear in mind that the term "holding" throughout the Act "includes all land held by the same tenant of the same landlord for the same term under "the same contract of tenancy" (§ 4). It follows, therefore, that there may be two separate "holdings" by the same tenant under the same landlord if the land is held for a different term or under a different contract. Hence it will be necessary in such cases to give separate notices in respect of each holding, whenever notices are necessary under the Act. Another definition which may be given here is that of the term, "contract of tenancy," which throughout the Act means not only a letting of land under any instrument, "for a term of years, or for lives, or for lives and years," but also a letting from year to year, or at will (§ 4).

Three classes of improvements are recognised (§ 5) as entitling a tenant to compensation. They must all have been "executed" after February 14, 1876; and the compensation, if any, due in respect of them will only be paid at the end of the tenancy, whether such tenancy is determined by effluxion of time, by the act of either landlord or tenant, or by any other cause.

As to First-Class Improvements.—These are thirteen in number, and come under the head of permanent improvements, for which the highest scale of compensation is awarded. They are ranged in alphabetical order, thus:—

1. Drainage of land.
2. Erection or enlargement of buildings.
3. Laying down permanent pasture.
4. Making and planting osier beds.
5. Making water-meadows, or works of irrigation.
6. Making gardens.
7. Making or improving roads or bridges.
8. Making or improving water-courses, ponds, wells, or reservoirs, or works for supply of water for agricultural or domestic purposes.
9. Making fences.
10. Planting hops.
11. Planting orchards.
12. Reclaiming waste land.
13. Warping land.

The wording of § 6 is of great importance. It runs thus:—"An improvement shall not in any case be deemed, for the purposes of this Act, to continue unexhausted beyond the respective times" applicable to each class of improvement, namely, twenty, seven, and two years. These periods, therefore, merely represent the maximum limit of time during which compensation can be claimed. It will be for the valuers in each case to say, with reference to each improvement, whether within the specified limits of time the improvement is or is not exhausted. In Committee on the Bill, Sir T. D. Acland and others showed that the value and permanence of the improvements specified in each class must often differ, though they are classed together, and that they cannot be put all on a level. It was not possible in the Act to distinguish between each improvement, or assign to each its proper period of unexhaustion. This will be the business of the valuers. The remarks which follow, therefore, upon each class of improvement, must be understood with the qualification that a tenant acquires no absolute vested interest extending over the maximum period applicable to the three classes of improvements. His interest is conditional, depending upon the question whether, in the opinion of the referees, umpire, or judge, the particular improvement is unexhausted when the tenancy determines. It may deserve notice, however, that it is open to the landlord and tenant by special agreement to fix prospectively the period during which the improvement shall be deemed unexhausted, instead of leaving that matter to be dealt with retrospectively. In the opinion of some persons, a definite arrangement of this kind may be advantageous to both parties.

The thirteen improvements of the first class may be deemed unexhausted, and the tenant's claim for compensation therefore *may* continue in respect of them, for twenty years, dating from the end of the year of tenancy during which the outlay has been made (§ 6). Thus, assuming that the year of tenancy upon a holding to which the Act applies expires at Michaelmas, 1876, and any one of these thirteen improvements is made upon this holding, with the safeguards and conditions imposed by the Act, between February 14 and Michaelmas, the twenty years will begin to run with the next year of tenancy, 1876–7.

In dealing with an absolute owner, the basis of the tenant's compensation will be the cost price of each improvement, with a proportionate deduction for each year subsequent to that in which the outlay is made, until either the term of twenty years expires, and the improvement thus becomes, in a legal sense, exhausted (§ 7); or until the period of actual exhaustion fixed by the valuers in the particular case. By § 31 the award is to find and state the time at which each improvement is taken to be exhausted. Therefore, the period during which compensation can be given depends upon the finding of the valuers or arbitrator as to the period during which the improvement will remain unexhausted after the tenancy determines. This period must in no case exceed twenty years, and it may fall far short of twenty years if the valuers so determine. In either event, the longer the tenancy continues, the smaller the compensation which falls to be paid by the landlord. Assuming that the improvement is one which the valuers will pronounce to remain unexhausted during the full term limited by the Act, the tenant will be entitled to receive back again, out of the land, in twenty equal yearly instalments, the money which he put into or upon the land; and if he leaves his holding before the end of twenty years, and is thus unable to recoup himself, his landlord will become bound to pay the instalments which may remain due. It follows, of course, that if the tenancy continues for twenty years, dating from the end of the year of tenancy in which the outlay is made, no compensation can be claimed. The tenant has lodged to his credit in a bank a capital sum, to be drawn out in given proportions within a limited term by the occupier for the time being; and by length of occupation he himself has exhausted the credit.*

An important limitation to this rule as to the amount and duration of the claim must be kept in view. No compensation can be had for a first-class improvement, unless such improvement is made with the previous consent, in writing, of either landlord or agent (§ 10). Again, it must be noted that compensation for a first-class improvement is given upon the foregoing basis only if, at the time when such consent was given, the landlord was the absolute owner of the premises. It will, therefore be the business of the tenant, upon asking and receiving the landlord's consent to make any one of the thirteen permanent improvements, to ascertain also whether the landlord answers the definition of "absolute owner" given in the interpretation clause, that is to say, whether he is "capable of disposing, by appointment or otherwise, of the fee simple or whole interest of or in freehold, copyhold, or leasehold land." If he be freeholder, copyholder, or owner of leaseholds, then it is immaterial to what extent his land may be mortgaged, encumbered, or charged; he is "absolute owner" for the purposes of the Act, and the tenant will have a lien upon the land for the repayment of so many of the twenty or other less number of instalments as still remain due.

The amount of compensation due in respect of a first-class improvement may be ascertained thus:—Divide the cost of the improvement by the number of years during which it is found to be unexhausted, dating from the year of tenancy following that in which the outlay is made. The result, multiplied by the number of years during which the tenancy has continued subsequent to this date, will give what the tenant has enjoyed "in kind;" and this amount, deducted from the original outlay, will represent the compensation due from the landlord. For example:—

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* As I read Clause 7 of the Act, the repayment for outlay on this class of improvements does not rest upon any variable basis, but is in each case determined entirely by the lapse of time. so that the advantages which have accrued to the tenant who has made the improvement may vary very much. For instance, if he build a new shed or stable, as soon as the building is completed the advantage commences, and it may be quite correct to say that an equal twentieth part of his outlay is returned to him in each year; the same of waterworks, roads, bridges, and possibly of drainage, though in the latter case I should be inclined to say that if the drainage be satisfactorily done the value to the tenant increases for a period of years. But in the laying down of land to permanent pasture, the making and planting of osier beds, making of gardens, of fences, planting hops, orchards, reclaiming waste land, it is quite manifest that for some years after the cost of the improvements has been incurred there can be no appreciable return to the tenant; while, during the latter period of the twenty years, the return may be almost sufficient to recoup the whole cost of the operation. The tenant, therefore, whose tenancy comes to an end during the earlier period after such an improvement has been executed will not really be reimbursed for his outlay in the same proportion as the one who has continued to occupy until the remunerative return has commenced.—*Note by Mr. J. D. Dent.*

100*l.* spent on Improvement of first class in year of tenancy ending	October, 1876
Tenancy determines	October, 1880
Improvement found to be exhausted in year of tenancy ending	October, 1886.

Here the 100*l.* has to be spread over ten years. Dividing the 100*l.* by ten, and multiplying the product by the four years during which the tenancy continued after the improvement was executed, you find that the tenant has taken back 40*l.* out of the 100*l.*, and the difference between these two sums is the amount of compensation to be paid. In other words, the improvement having a life of ten years, six of which have still to run when the tenancy determines, the tenant leaves behind him in the soil 10*l.* × 6, or 60*l.*, which the landlord must repay. A shorter way of stating the process is, that the tenant here is entitled to his original outlay less four-tenths. It will be understood that if, in examining the claim, the referees or umpire find that the improvement is exhausted, the tenant will receive nothing. The absolute owner, therefore, possesses this substantive protection against undue claims. It is clear, too, that some of the more permanent improvements will benefit the land long after the limit of twenty years; and as the landlord's consent must first be obtained, and he can either withhold it, or couple it with his own conditions, there does not seem to be much ground for alarm at the operation of the compensation clause relating to first-class improvements.

If the landlord has not a disposing power over the land—if, for instance, as in the ordinary case of settled estates, he holds them merely for life—then the principle of time adopted in § 6, and of outlay named in the first part of § 7, is further limited by the principle of letting value introduced in the latter part of § 7. The tenant's compensation is then not to exceed "a capital sum fairly representing the addition which the improvement, as far as it continues unexhausted at the determination of the tenancy, then makes to the letting value of the holding" (§ 7). This new principle introduces an additional element of uncertainty into the measure of compensation. The cost price of an improvement is easily ascertained, and the assignment of the number of years for exhaustion may not be difficult. But there is more room for difference of opinion and for dispute upon the question whether the improvement has added to the letting value, not when originally made, but in its state of greater or less exhaustion at any time, not exceeding twenty years, when the tenancy may end. When the Bill was first introduced, letting value was the basis of compensation applicable to the estates both of absolute and limited owners. The principle was retained in the case of limited owners in the interests of the remainder-man, so that upon coming into the estate he might not be bound by any engagements of his predecessors in title, to which engagements he had been no party, unless the property was really benefited by the outlay. Tenants must remember, therefore, that in dealing with a limited owner they have not the same security for unexhausted improvements as they possess in dealing with an absolute owner. In the latter case, the tenant will receive back the capital he spends, either in money or in kind,—in kind so long as his holding lasts; in money when the holding is determined, if the improvement is found to be unexhausted when the claim arises. In dealing with a limited owner, he will still receive back, during the tenancy, what the land or occupation yields to him in kind for the improvements he has made; but at the end of the tenancy, instead of receiving back the amount of his outlay, less a proportionate part for each year up to the period of exhaustion, he must prove that the letting value of the holding is increased by this particular improvement: his compensation in money depends upon the additional rental which the improvement will yield in the remaining years during which it will be deemed to continue unexhausted.

The extent to which the improvement adds to the letting value of the holding is to be decided, in case of dispute between the parties, by the referees or umpire, for whose appointment provision is made in the part of the Act relating to procedure. It will be for them to ascertain, not what is the present letting value, because that may be increased by other circumstances, such as the construction of a railway or the growth of a neighbouring urban community; but how much of the increased letting value, when the farm falls in, is due to the particular expenditure for which compensation is claimed. It will be for the referees or umpire also to decide, in the words of § 7, what is "the capital sum fairly representing" this addition. Let us assume that the additional letting value due to the improvement is ruled to be 10*l.* per annum, and that the improvement has ten years to run before it is exhausted. Will the capital sum "fairly representing" this additional rent be ten times the amount, that is, 100*l.*? or will it be the present capitalised value of an annuity of 10*l.*, terminable in ten years? It may be assumed that the latter rule will apply, and the subjoined Tables show that the sum allotted to the tenant upon a settled estate will usually be less than that which he will receive where his landlord is absolute owner. The exception will be where the outlay has been so judicious and so remunerative as to create an improved rental equivalent to over 8 per cent. upon the cost of the improvement (see Table C). For every 100*l.* laid out by the tenant upon first-class improvements, his claim against an absolute owner will be as follows, supposing the expenditure to be made during the year of tenancy, 1876–7, and assuming also that the improvements are found to continue unexhausted during the maximum period specified in the Act:—

TABLE A.*

Year.	Compensation due.	Year.	Compensation due.
1877–8	£95 0	1887–8	£45 0
1878–9	90 0	1888–9	40 0
1879–80	85 0	1889–90	35 0
1880–1	80 0	1890–1	30 0
1881–2	75 0	1892–3	25 0
1882–3	70 0	1893–4	20 0
1883–4	65 0	1894–5	15 0
1884–5	60 0	1895–6	10 0
1885–6	55 0	1896–7	5 0
1886–7	50 0		

Upon the estate of a limited owner, the tenant's claim for every 100*l.* laid out upon first-class improvements, made at the same period, will be ascertained, first, by fixing the addition which this expenditure has made to the letting value of the holding, say 5*l.*, and then capitalising this sum at the number of years' purchase during which the improvements were unexhausted. If the period of unexhaustion be twenty years, then the result will be as follows:—

TABLE B.

Year.	Compensation due.	Year.	Compensation due.
1877–8	£60 0	1887–8	£35 0
1878–9	58 5	1888–9	32 10
1879–80	56 0	1889–90	28 15
1880–1	53 15	1890–1	25 0
1881–2	52 10	1891–2	21 5
1882–3	50 0	1892–3	17 10
1883–4	47 10	1893–4	14 15
1884–5	43 15	1894–5	4 15
1885–6	41 5	1895–6	2 10
1886–7	37 15		

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* These Tables are from Mr. Winch's Treatise on the Act (Stevens and Sons), but a different view of the Compensation Clauses of the Act is taken in this Paper, and limits the use of the Tables.

Thus, if his outlay of 100*l.* only added 5*l.* per annum to letting value, the tenant on a farm belonging to a limited owner would be entitled to claim considerably smaller compensation than the tenant of an absolute owner, in any one of the years specified. The following Table shows the compensation due if the letting value is held to be increased 8*l.* per annum upon each 100*l.* spent by the tenant:—

Table C.

Year	Compensation due	Year	Compensation due.
1877–8	£96 0 0	1887–8	£56 0 0
1878–9	94 0 0	1888–9	52 0 0
1879–80	90 0 0	1889–90	46 0 0
1880–1	86 0 0	1890–1	40 0 0
1881–2	84 0 0	1891–2	34 0 0
1882–3	80 0 0	1892–3	28 0 0
1883–4	76 0 0	1893–4	22 0 0
1884–5	70 0 0	1894–5	14 0 0
1885–6	66 0 0	1895–6	7 12 0
1886–7	62 0 0		

The question whether letting value is to be the principle of compensation depends, it will be seen, not upon the nature of the ownership at the determination of the tenancy, when the amount of compensation will be ascertained and paid, but upon the title of the landlord who gave his consent to the particular improvement (§ 7). It may therefore happen, upon an estate not in settlement at the time when an improvement was sanctioned and made, that, owing to a subsequent settlement, compensation in respect of the improvement may be paid by a limited owner upon the basis applicable to holdings under absolute owners. The rights of the tenant remain unchanged by any change in his landlord's title arising after consent once given.

The tenant's claim to compensation for improvements of the first class is subject to one deduction, which will arise fairly enough when the tenancy is determined. The question, "What have these improvements cost?" if the claim arises under an absolute owner, will then be followed by another question—are they in "tenantable repair or good condition?" (§ 11). If the landlord, being an absolute owner, is called on to take over the outgoing tenant's improvements, they must really represent the unexhausted value assigned to them by the tenant, subject to the limitations in the Act. The amount found due to him will, therefore, be reduced by "any sum reasonably necessary to be expended" (§ 11) for putting into "tenantable repair or good condition" the buildings, fences, ponds, drains, or other works in respect of which the claim arises. It will be understood that, in the absence of special agreement to the contrary, no such liability attaches to the tenant if the improvements are run out and exhausted. Nor will the point arise at all—at any rate it need not arise in any separate form—under claims made against limited owners, because, the question there being what addition, if any, has been made to the letting value of the holding by the improvements, their want of repair or good condition will be one of the elements to be considered in settling this question. It is obviously for the tenant's interest that they should be in proper order when he surrenders his holding, for he will then reap the full benefit which the Act contemplates, while he will avoid the uncertainty and annoyance which must arise when a point of this kind has to be decided by umpires or referees.

As the tenant is entitled to payment from the absolute owner of "the sum laid out" on the improvement, less a proportionate part for each year during the period of exhaustion, it follows that, when the claim arises, the landlord can raise no question upon the economy or extravagance of the particular outlay. It may be that a tenant has spent more money than he need have spent had he used the proper means, or set about the improvement in the most economical method; but the landlord cannot dispute the amount ascertained and vouched for as having been spent by the tenant. Under these circumstances, when asked for his consent to an improvement of the first class, the landlord will probably think it necessary to couple that consent with a limitation of the sum to be spent upon it, or of the period during which compensation can be claimed; or he will require that the work shall be executed under inspection. As will presently be seen, another principle is applied to compensation for second- and third-class improvements, and the landlord is protected by the words of the Act against any undue expenditure upon them.

As to Improvements of the Second Class.—These improvements, though not permanent, are durable, and, unless the referees think the improvements are exhausted when the tenancy determines, or will be exhausted before the maximum period mentioned in the Act, the tenant is entitled to compensation for them for seven years following the year of tenancy in which his outlay is made (§ 6). Second-class improvements are six in number, specified as follows (§ 5):—

1. Boning of land with undissolved bones.
2. Chalking of land.
3. Clay-burning.
4. Claying of land.
5. Liming of land.
6. Marling of land.

Thus, if one of these improvements be made at any time during the year of tenancy ending Michaelmas, 1876, the seven years begin to run with the next succeeding year, and the claim to compensation will cease after Michaelmas, 1883. But, as in the case of first-class improvements, the landlord's liability will not necessarily continue during the seven years. It will depend upon the period of exhaustion as found by the referees. In the Act the rule applicable to the tenant's compensation for second-class improvements (§ 8) follows, with the exception of one important word, the rule laid down in the case of first-class improvements made under an absolute owner. For the latter class of improvements the tenant, as we have seen, is entitled to "the sum laid out" by him, less a proportionate part of this sum for each year after the improvement was made up to the period of exhaustion. But a tenant's claim for second-class improvements can only be for "the sum *properly* laid out" by him, with a proportionate deduction for each subsequent year during which his occupancy continues and the improvement remains unexhausted. The words "properly laid out" will no doubt give considerable employment to the valuers, and in disputed cases much may be said in deduction of the claim. The language of Section 8 will not permit a landlord to dispute the propriety of the particular kind of improvement. Proof that the tenant has spent his money will be proof of the necessity of such an improvement and of the title to compensation for it. But the landlord may seek to reduce the claim on the ground that too much has been done; that the work of boning, chalking, marling, &c., has been injudiciously carried out, or has proved partially ineffectual through want of proper skill or care.

The reason why it is competent for the landlord under § 8 to question whether the sum spent by the tenant has been "properly laid out" is probably to be found in another distinction drawn in the Act between the two classes of improvements. If the tenant chooses to make a second-class improvement he need not obtain the previous consent of the landlord, and may establish a conditional claim even contrary to the landlord's express wish. All he is bound to do (§ 12) is to give the landlord notice not less than one week and not more than six weeks beforehand of his intention to make the improvement. This notice gives the landlord the opportunity in ordinary cases of inspecting the work done, and of seeing that it is properly done, though the Act provides no machinery for such supervision. The notice also gives the landlord the opportunity of at once stopping the improvement by giving the tenant notice to quit, because there is an express provision that the tenant can no longer claim compensation for second-class improvements executed after receipt of notice to quit (§ 12). A previous written consent from the landlord would dispense with the necessity for notice of intended improvements by the tenant; or landlord and tenant may, by mutual consent, make a special contract within the Act defining the work to be done and the amount of compensation.

It would tend greatly to prevent disputes and litigation if the landlord arranged to supervise the work done through his agent or otherwise, and the tenant's statement of outlay, accompanied by proper vouchers, were then signed by the landlord or agent. No question could then be raised upon claims made at the end of the occupation as to whether the money had been "properly laid out." One limitation upon the tenant's power to make second-class improvements independently of the landlord's opinion or sanction has just been mentioned. If the tenant has either given or received notice to quit, he is forbidden to make any of the six improvements unless he receives the landlord's written consent (§ 12). Thus no tenant under notice will be able to commit the landlord to an expenditure which will mainly fall upon the latter, and which will certainly set up a troublesome claim, and perhaps end in expensive litigation. A tenant under notice can have no right to farm for his successor, and compel his landlord to contribute possibly six-sevenths of the money; for that is what the right to make improvements of the second class at such a time would practically come to.

Claims for improvements of the second class are to be assessed upon one basis only—that laid down by the Act in the case of absolute owners. They are not affected by the status of the landlord. How much, therefore, or how little they have added to the letting value of the holding is immaterial; and in making them the tenant is relieved from the necessity of inquiring whether his landlord is a limited or an absolute owner. If the referees find that the improvement is good for the full term of seven years, the claim for a second-class improvement abates every year by one-seventh of the amount "properly laid out" upon such improvement, beginning with the year of tenancy in which the outlay is made. The following, therefore, would be the tenant's claim in the case stated:—

Sum expended on Second-Class Improvements, during year of Tenancy, 1876–7—£140.

Year.	Compensation due.	Year.	Compensation due.
1877–8	£120	1880–1	£60
1878–9	100	1881–2	40
1879–80	80	1882–3	20

The amount of compensation due for a second-class improvement will vary, of course, with what is found to be its "life." The rule to ascertain the amount due will be the same as that given with respect to first-class improvements.

As to Third-Class Improvements.—These fall within the category of temporary improvements, and are placed under the two following general heads:—

1. Application to land of purchased artificial or other purchased manure.
2. Consumption on the holding by cattle, sheep or pigs, of cake or other feeding-stuff not produced on the holding (§ 5).

These improvements may continue unexhausted, and therefore remain the subjects of compensation, till the end of two years following after the year of tenancy in which the outlay is made (§ 6). The amount of compensation in respect of them will be "such proportion of the sum *properly* laid out by the tenant on the improvement as fairly represents" its value to the incoming tenant at the end of the tenancy (§ 9). Upon the proper laying-out of the money upon manure and feeding-stuff will depend the benefit to the new tenant, and therefore these two questions practically resolve themselves into one for the consideration of the valuer.*

Hitherto we have found the Act requiring as a condition precedent to compensation for first-class improvements consent by the landlord, and in the case of second-class improvements notice to the landlord. The tenant is relieved from both these conditions in the third description of improvements, and it would be obviously impossible to require either condition from him as a preliminary to the manuring of his land or the feeding of his stock. This would be to make the landlord the farmer. Still there are important reservations to his power of claiming compensation. No such claim, for example, can be made if, after the manure has been applied or the stock has been fed on the particular land so treated, he has taken from this portion of his holding "a crop of corn, potatoes, hay, or seed, or any other exhausting crop" (§ 13). Again, he is not entitled to compensation for the consumption of cake or other feeding-stuff where, under custom or agreement, he claims payment from the landlord or incoming tenant for "the additional value given by that consumption to the manure left on the holding at the determination of the tenancy" (§ 14). Thus, where the Act applies, a tenant may claim for artificial manures under the Act, and for consumption of feeding-stuffs either under the Act, or under agreement or custom, at his option.

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* The first question which the valuers will have to face is the proportion of the original cost which may "fairly represent the value of the improvement, at the determination of the tenancy, to an incoming tenant." An approximation to this value for cake, bones, &c., has long been made by clauses in agreements, and by custom in Lincolnshire, Nottinghamshire, and other counties. Mr. Lawes, in his valuable contributions to this 'Journal' has given a reliable testimony to the unexhausted value of manures applied under certain conditions; and it would, undoubtedly, be a matter of congratulation to valuers and to the agricultural public if investigations of a similar character could be carried out under other and varying conditions of climate and of soil. But even now, with the limited information we possess, I am inclined to think that practical men, taking into consideration the customs of their own counties, and guided by the direction of the Act, will not find any insuperable difficulty in the construction of this clause; and I believe that in many cases, if difficulty should be anticipated, agreements will be made between landlord and tenant which will define in terms the proportionate payments to be made.—*Note by Mr. J. D. Dent.*

Two other important restrictions will govern the claim. First, in ascertaining the amount due to the tenant, he will not be credited with any larger outlay during the last year of his tenancy than the average amount of his outlay for like purposes during the three preceding years, or during any shorter period if his tenancy has not lasted so long (§ 15). Thus if he spends on manure and cake or feeding-stuff 800*l.* in 1876-7, 700*l.* in 1877-8, 654*l.* in 1878-9, and 800*l.* in 1879-80 when the tenancy expires, the basis of compensation in respect of the last year's outlay will not be 800*l.* but one-third of 800*l.*, 700*l.* and 654*l.* added together, or 718*l.* The object of this limitation is to prevent an unfair expenditure upon artificial manure or cake in the last year of the tenancy.

The second restriction is that if any hay, straw, roots, or green crops have been sold off the holding within the last two years of the tenancy, the estimated value of the manure that would have been produced by the consumption of these growths on the holding is to be deducted from the compensation claimed, "except as far as a proper return of manure to the holding has been made in respect of such produce sold off" (§ 15). In other words, the land rented has a first claim upon the crops here specified, and provision is made for their return to the soil in the shape of manure, or for an equivalent return from bought manure or from purchased feeding-stuff. This equivalent must be rendered before the bought manure, and the cake or feeding-stuff applied during the same period, can count to the credit of the outgoing tenant.

Like the tenant who makes a second-class improvement, the tenant making a third-class improvement is exempt from the necessity of considering the nature of his landlord's interest in his property, and his compensation is the same under any tenure. In estimating his compensation, it will be for the referees to decide as best they can what proportion of his outlay "fairly represents" to his successor the value of the manuring and stock-feeding of the two previous years. Here, again, the farmer must be careful to keep accounts and vouchers, which will serve as the basis of valuation in case he quits the holding.

GENERAL CONDITIONS AFFECTING LANDLORD AND TENANT.

Set-off and Deductions from Tenant's Compensation.—Besides the sum necessary for putting a first-class improvement into tenantable repair or good condition (§ 11), the ex-tenant's compensation for any class of improvements is subject to certain deductions before he can claim payment of any part of the amount found due to him. These deductions are—

(1.) For taxes, rates, and tithe rentcharge to which the tenant is liable as between him and the landlord.

(2.) For rent (§ 16).

(3.) The value of any benefit (such as surrender of rent, supply of materials, &c.) which the landlord has given or allowed to the tenant as a consideration for his making the improvement at his own expense (§ 17).

(4.) Compensation claimed by the landlord at the end of the tenancy for waste* committed or permitted by the tenant (§19); and

(5.) Compensation claimed by the landlord for the breach by the tenant of any covenant in the lease or agreement under which the tenant holds (§ 19).

The landlord's claim to compensation under the two last heads is subject to two limitations. In the first place, he cannot make any such claim unless the tenant claims compensation under the Act for an improvement, no matter of what class. The landlord can only allege the waste or the breach by way of counter-claim, "and not otherwise" (§ 19), so that if the tenant has reason to believe that a counter-claim may be set up by the landlord exceeding the compensation to which he is entitled, he may defeat his landlord's set-off, as far as the operation of the Act is concerned, by remaining quiescent. The second limitation upon the landlord's title to compensation is one of time. He cannot go back more than four years before the tenancy ends; any waste or breach of covenant alleged by him, if it relates to acts of commission or omission in a matter of husbandry must have occurred within this period (sub-sect. 19). This proviso is a safeguard against the revival of old defaults which the tenant, owing to the remoteness of the acts or the neglect relied on, may find it difficult to rebut. In the event of waste alleged in respect of buildings, and matters not relating to husbandry, the four years' limitation will not apply.

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* It was at first proposed to specify the acts and things which should be deemed waste on the tenant's part, whether voluntary or permissive waste, such as breaking-up of old grass without the landlord's written consent; causing or permitting land to be foul or neglected; damage to plantations, coppices, or timber included in the holding; loss of manure by hay, straw, roots, or green crops removed off the holding without the landlord's written consent; loss of manure not returned to the holding in lieu of produce sold off subject to the manure being brought back; mowing of meadows, other than water-meadows, without manuring; mowing of old pasture; neglect of drains, outfalls, or water-courses; neglect of gates or fences; neglect of ordinary repairs of buildings for which the tenant is liable; neglect of roads; over-cropping by taking too many successive white-straw crops; over-cropping without manuring.—(Duke of Richmond's Speech in introducing Bill, March 12, 1875.) But as any act or thing not so specified was still to be deemed waste, it seemed useless to specify any; and all alleged acts of waste will therefore be for the determination of the referees or umpire, or of the County Court Judge.

In justice to the tenant, it was necessary to give him a reciprocal claim for compensation in case of breach of covenant or other subsisting agreement by the landlord. The Act accordingly recognises this corresponding right; but while the landlord cannot recover for the waste or the breach unless by counter-claim to the compensation sought by the tenant, so the tenant cannot recover for the landlord's breach alone. He must claim compensation in respect of an improvement, and then only is entitled to obtain compensation for the breach (§ 18).

PROCEDURE.

It may be hoped that, with the help of the explanations already given, a tenant will be able to satisfy himself without much difficulty whether, first, his holding comes under the operation of the Act, and next, whether he is properly entitled to claim compensation. He knows, or should know, the exact sum he has spent upon each class of improvements, and should have carefully recorded not only the particulars of his outlay, but the period at which each improvement was executed. We have now to consider what steps the Act prescribes to the tenant who desires to set up a claim, and, if the parties are unable to agree upon the sum so claimed, how the amount of compensation is to be arrived at and payment enforced.

Notice of Claim by Tenant.—It is all-important to remember that a tenant is barred from any compensation under the Act, unless one month at least before the tenancy determines he notifies in writing to the landlord his intention to claim compensation under the Act. Such notice must contain, "as far as reasonably may be, the particulars of the intended claim" (§ 20). It may take this form, addressed to the landlord or his agent—

"SIR,—Pursuant to the provisions of the Agricultural Holdings (England) Act, 1875, I hereby give you notice that I intend, on the determination of my tenancy of this holding, to claim compensation from the landlord for the following improvements executed thereon:

"1. Draining the field called Little Biggs, containing 13 A. 6 R. 20 P., at a cost of l. in the year of my tenancy, ending Michaelmas 18 .

"2. Erecting barn at , at a cost of l. in the above year.

"3. Enlarging cow-house at the same farm at a cost of l. in the year of my tenancy, ending Michaelmas 18 .

"4. Laying down permanent pasture in the field called Whiteladies, containing 7 A. 1 R. 18 P., at a cost of *l.* in the year of my tenancy, ending Michaelmas 18 .

"5. Boning of Blackacre Field with undissolved bones, at a cost of *l.*, in the year of my tenancy, ending Michaelmas 18 .

"6. Application to (*mentioning fields or crops*), of tons of guano, at a cost of *l.*, in the years of my tenancy, ending Michaelmas 18 , and Michaelmas 18 .

"7. Consumption on my holding, in the years of my tenancy, ending Michaelmas 18 , and Michaelmas 18 , by cattle and sheep of tons of cake, and tons of (*other feeding-stuff, mentioning same*) not produced on the holding but purchased by me, at a cost of *l.*

"Dated the day of 18 ."

This notice must be signed by the tenant or his agent, or, in case of the tenant's death, by his executors, and must be addressed to the landlord or his agent. The improvements specified in this notice belong to each one of the three classes distinguished in the Act. It will be necessary, therefore, for the tenant or his representatives to bear in mind the different periods within which each of his improvements remains unexhausted, and to see that he does not include any of which he has enjoyed the full benefit during his tenancy. Here also it may be mentioned that the claim will pass upon bankruptcy to the tenant's assignees, who may urge and realise the claim for the benefit of the estate.

The notice may either be given personally to the landlord or agent, or left for the landlord or agent at his last known place of abode in England, or by posting it to his last known place of abode in England; but if so sent by post, the letter must be registered. The time of service in the event of such a letter being sent will be deemed to be the time when the letter would be delivered in ordinary course of post (§ 41). It will be necessary, therefore, to post the letter so that the notice shall reach the landlord or agent, in the terms of § 20, "one month at least"—by which is meant one calendar month—before "the determination of the tenancy." The same three modes of service—personally, by messenger, or by letter—apply to any "notice, request, demand, or other instrument" under the Act, whether on the part of landlord to tenant, or of tenant to landlord (§ 41). As it may be necessary to prove service of notices, &c., a memorandum should be made and preserved of the time and mode of such service; and in the case of a letter, it will be necessary to prove that it was properly addressed and posted, and contained the notice, &c., in question.

Counter-claim by the Landlord.—Upon receipt of the tenant's letter giving notice of a claim, it will then be for the landlord to consider whether he will prefer a counter-claim for compensation on account of waste or breach of covenant. Such counter-claim, if not given before the tenancy is determined, must be given within fourteen days afterwards. It must also be in writing, and contain, like the tenant's notice, "the particulars of the intended claim as far as reasonably may be" (§ 20, sub-sect.). Such counter-claim may run as follows :—

"SIR,—I have received your claim for compensation under the Agricultural Holdings (England) Act, 1875, and you will please to take notice that, pursuant to the provisions of the said Act, I intend to make a counter-claim against you for compensation due to me in respect of the following matters:

"1. For felling trees in the wood called Burntacre, in the year 18 , the amount of such waste being *l.*

"2. For breaking up old grass, without my consent, in the Uplands meadow, the amount of waste in respect hereof being *l.*

"3. For neglecting to repair the farm-buildings in your occupation, the amount claimed by me in respect of such neglect being *l.*

"4. Non-repair of gates, fences, drains, and watercourses at the home-farm, in respect of which non-repair, I claim the sum of *l.*

"5. For breach of the covenant contained in your lease dated the day of 18 , as to the cultivation of your holding in the year 18 .

"Dated the day of 18 ."

This notice will be signed by the landlord and addressed to the tenant. If signed by the landlord's agent, it will require a slight variation in its wording.

Reference to Single Referee.—If the landlord and tenant do not agree upon the amount, mode, and time of payment of compensation to be paid to one or both, the difference between them will be settled by reference (§ 21). Expense may be saved if they have confidence in any one individual, for then they may jointly appoint him as a single referee (§ 22, sub-sect. 1). His appointment must be in writing, signed by both parties (§ 22, sub-sect. 10). The delivery of such appointment, either to a single referee, or to one of two referees, will be deemed a submission to a reference by both parties in the first case, and, in the second case, by the party delivering the appointment; and neither party can revoke the submission or the appointment without the consent of the other (§ 25).

There is a provision intended to prevent an evil very well known to those who have experience of arbitrations—delay in obtaining the award. By this provision a single referee is bound to make his award, at least to "make it ready for delivery," within twenty-one days after his appointment (§ 29). The clause is so worded because the referee, according to ordinary rules of practice, need not deliver the award till his costs are paid. It is sufficient, therefore, to require that he should be ready with his award within the period limited, should either party then wish to take up the award. If the referee fails to act after seven days' notice in writing from either party, or if he begins the reference, and before making the award, dies, or becomes incapable to act, the parties may then begin again *de novo*, and either appoint a new single referee in his place, or if they are unable or unwilling to concur in such a selection, they may proceed according to the provisions next referred to (§ 22, sub-sect. 2).

Reference to two Referees.—If the parties cannot agree in the choice of a single referee, each of them is to appoint a referee; and in case of death, incapacity, or failure of either referee to act, after seven days' notice from either party, the party who appointed him is bound to replace him by another. Written notice of every appointment of a referee by either party must be given to the other; and to meet the not uncommon case of refusal to appoint on either side, it is enacted that, upon failure to appoint by one party, after fourteen days' notice from the other requiring such appointment, the latter may apply to the County Court of the district within which the holding, or the larger part of the holding, is situated, and within fourteen days of such application, the Court is to appoint "a competent and impartial person" as referee (§ 22, sub-sects. 3–6).

The County Court Orders, 1875, relating to the Agricultural Holdings Act, provide that this application shall be by summons, taken out by the party who desires the appointment, and addressed to the other party. The summons will direct him to attend at the Judge's or Registrar's chambers on a day mentioned, which (except by consent) is not to be less than seven days from the date of the summons. The applicant's solicitor is to serve this summons personally. Upon the day named the parties are to attend at the Judge's or Registrar's chambers, and, unless cause to the contrary be shown by the party summoned, the appointment asked for by the applicant will be made by the Court and endorsed on the summons.

Appointment of Umpire.—Two referees having been chosen, whether by the parties or by the County Court, their first duty, before entering on the reference, is to appoint an umpire, and such appointment must be in writing (§ 22, sub-sects. 7 and 10). If they fail to make this appointment within seven days after request from either party—and such failure will usually occur, no doubt, through difference of opinion between the two referees—the County Court, upon the application of either party, will choose "a competent and impartial person" as umpire (sub-sect. 9). Such application, under the County Court Orders, will be by summons, and follow exactly the course just explained, to be taken upon application to the Court for the appointment of a referee. There seems to be an omission of any machinery for requiring the umpire to make his award; but, in case of death or incapacity before award, his place may be filled by the referees, or on default by them, by the County Court (sub-sect. 8).

In appointing an umpire or referee, the Judge of the County Court may act, whether he is at the time without or within his district; and, by consent of the parties, the Judge's powers in making either of these appointments under the Act may be exercised by the Registrar of the Court (§ 24). Delay may often be avoided and expense saved if the parties can agree to leave the appointment with the Registrar.

Instead of leaving the choice to the referees, either party has the option of requiring that the umpire shall be appointed either by the Inclosure Commissioners or by the County Court. This option must be exercised on the appointment of the referee; it must be notified in writing to the other party, and the most convenient course will be to do so in the same notice which is necessary for intimating the appointment of referee (§ 23, sub-sects. 1 and 2). The case can only arise where two referees are to act, and the landlord or tenant, or their respective agents, may convey the notice in this form:—

"SIR,—I hereby give you notice that, pursuant to the provisions of the Agricultural Holdings (England) Act, 1875, I have appointed [*fill in name and address of referee*] to act as [my] referee in the reference under the said Act between [us] [*or* between A. B. and C. D., *names of landlord and tenant*]. I hereby give you further notice that, under the powers contained in the Act, I require that the umpire in such reference, and any successor to him, shall be appointed by the Inclosure Commissioners for England and Wales, [*or* by the County Court of the district, holden at [*fill in place*]. Dated the day of , 18 ."

A distinction exists with regard to this option, and it must not be lost sight of. If the choice of umpire is remitted to the Inclosure Commissioners by the action of either party, the other can raise no objection. If, however, either party desires to invoke the County Court, the other may dissent by notice in writing from the interference of this tribunal, and thereupon the County Court will be ousted of its jurisdiction. But the way to the appointment of umpire will not be blocked, because, on the application of either party, the Inclosure Commissioners are bound to appoint one, and their choice cannot be prevented or disputed (§ 23, sub-sects. 1 and 2).

Thus the choice of umpire may be made in several ways:—(1) by the referees, upon agreement by them, if the parties do not give notice to the contrary in naming their respective referees; (2) by the County Court, on the application of either party, in case the referees disagree, or in default of appointment by them; (3) by the Inclosure Commissioners absolutely, at the option of either party, if such option be signified in writing to the other on the original appointment of a referee; and (4) by the County Court, upon the same option, similarly signified, if the other side does not object; or, in the event of such objections, (5) by the Inclosure Commissioners. As the jurisdiction of the Inclosure Commissioners under § 23 only arises if either party invokes it on the appointment of a referee, it would seem to follow that the power of the Commissioners to appoint successors to umpires applies only in cases in which the umpires were originally chosen by them, and that they cannot, therefore, be properly asked to replace umpires who were chosen by the County Court or the referees. But it has already been shown that the County Court is empowered, under sub-sect. 9, to step in and appoint an umpire in default of such appointment by the referees; and we have therefore the small anomaly that suitors may require the Inclosure Commissioners to choose an umpire, in preference to the County Court, where it is an original appointment, or follows an original appointment by the Commissioners; but when the parties have once allowed the referees to make the original appointment, any substituted umpire can only be appointed by the referees, or, failing them, by the County Court, and neither party can go to the Inclosure Commissioners.

Powers and Duties of Referees.—We have seen that, upon delivery of a written appointment to the referee, the party so appointing him, or, in a case of a single referee, the parties jointly concurring in the appointment, are committed to the reference, and cannot afterwards revoke either this "submission" or the appointment (§ 25). We have also traced the steps necessary for the choice of umpire, before the business of reference is begun. Thus we have the tribunal duly constituted and seised of its subject. Henceforward it will proceed with its investigation, armed with the powers which the Act entrusts to it. The single referee, or the two referees or umpire, may proceed in the absence of either party, if they think it expedient to do so, after due notice given (§ 27). In the matter of evidence they may, at their discretion, "call for the production of any sample, or voucher or other document, or other evidence, which is in the possession or power of either party, or which either party can produce." It is somewhat remarkable that the Act provides no penalty for the non-production of documents, and no means for enforcing production. But as the non-production of any material sample, or voucher or other document, would be sure to tell against the interests of the party who was required and who failed to produce it, and might be held conclusive against his claims, the Legislature probably thought that no other penalty or *force majeure* was needed. A greater power than that of merely asking for documents is entrusted to the single referee, referees, or umpire; for they may administer oaths and take affirmations, and may require the sworn evidence of the parties and other witnesses, and if false evidence is given by any person so sworn or affirming, he may be indicted for perjury, provided that such evidence is given "wilfully and corruptly" (§ 26).

After taking such evidence as they may deem requisite for the determination of the question in issue between the parties, the referees have then to make their award, which must be in writing, signed by the single referee, or by the two referees, if they agree without calling in the umpire (§ 28). The single referee, as already stated, must be ready with his award within twenty-eight days after his appointment. The same period is prescribed where there are two referees, the twenty-eight days running, however, from the date of the appointment of the last appointed of them. If, however, they concur in thinking that more time is necessary to consider their verdict, they are empowered to extend this period, by writing under their joint hands, for three weeks, so that their award must be, in any case, "ready for delivery within a time not exceeding forty-nine days" after the last appointment of either of them (§ 29, sub-sect.). If the forty-nine days expire, and no award is ready for delivery, their whole authority ceases (§ 30) and is transferred to

The Umpire.—He thenceforth stands seised of the questions submitted to the referees, and is armed with the same powers of calling for samples and documents, of taking sworn evidence, and of proceeding in the absence of either party after notice duly given to both (§ § 26, 27). His award, when made, must also be in writing, and signed by him (§ 28). The referees are not required by the Act to inform the umpire of their disagreement and the termination of their authority. There even appears to be no obligation upon the parties to inform the umpire of his appointment, and obtain his consent to act. Again, there is no exact limit of time within which the umpire is required to commence his duties. If the parties are inactive, they may postpone the reference to the umpire indefinitely; or, if by this time they have had enough of referencing, a *locus penitentiæ* is here afforded to them, and they may settle their differences without troubling the umpire.

Should this happy consummation not be reached, however, the umpire must have his award ready for delivery within twenty-eight days after receiving written notice from either party or referee of the reference to him. If he finds that he cannot make it ready within this period, he, or either party on his behalf, must apply to the Registrar of the County Court, who, from time to time, may extend the period just mentioned. Such application, however, must be made before the expiration of the twenty-eight days, or of any prolongation of time granted by the Registrar (§ 30, sub-sect.). There is no limit to the number or length of the postponements which may be granted by the Registrar, but it is to be hoped that he will do his spiriting gently, and in practice exercise this wide discretion so as to discourage unnecessary delays. Applications made to the Registrar, under the sub-section, to extend the time for preparing the umpire's award, ought, it is presumed, to be by summons, when made by either party, as upon the appointment of referees or umpire; or after notice to the parties, when the umpire himself applies. But the County Court orders are silent on this point, and the application may possibly, therefore, be treated as an *ex parte* one.

It is important that the umpire should be asked whether he is willing to act before his appointment by the referees, and that neither they nor the parties should trust to the chapter of accidents. It is true that, if the referees agree, his appointment will be a sinecure; and he is not likely to be appointed by the Inclosure Commissioners, or by the County Court, without being aware of what is proposed, and consenting to the appointment. But if he has been appointed by the referees without his sanction, and if from this or any other cause he refuses or fails to act, no machinery is provided for compelling him to act or for substituting a fresh umpire. Death or incapacity are the only two incidents recognised as empowering the referees to appoint a successor to the umpire they have chosen; and neither the Inclosure Commissioners nor the County Court seem to be able to interfere in such a case. An awkward dead-lock may therefore occur, unless the consent of the umpire is secured before appointment, especially if he be a non-professional person.

The Award.—This must be in writing, signed by the single referee, or the two referees, or the umpire, as the case may be (§ 28). The different periods at which it must be ready for delivery have already been explained. We must remember that the award may have to deal with counter-claims by landlords as well as with claims by tenants; and, under the Act, it will not be enough to give a lump sum for compensation generally: the award must specify "as far as reasonably may be"—

(1.) The improvements, acts, or things for which compensation is awarded (§ 32);

(2.) The time at which each such improvement, act, or thing, was executed, committed, or permitted (*ib.*);

(3.) The time at which each improvement, for which compensation is given, becomes, for the purposes of the award, exhausted (§ 31);

(4.) The sum laid out by the tenant on each improvement (§ 32);

(5.) If the landlord, at the time of the consent given to a first-class improvement, was not an absolute owner, the extent to which such improvement adds to the letting value of the holding (*ib.*);

(6.) The sum awarded in respect of each improvement, act, or thing (*ib.*);

(7.) A day, not sooner than one month after delivery of the award, for the payment of the money awarded for compensation, costs, or otherwise * (§ 34).

The Act makes it *imperative* on the referees or umpire to find and state (3) the time at which each improvement becomes exhausted (§ 31), and also (7) to fix a day for payment of the sum awarded (§ 34). They are bound also to furnish the particulars classed under the other five headings; but with regard to these five, they need only specify the facts "as far as reasonably may be." If they fail in complying with the imperative directions of the Act in making the award, or if they award a sum generally for compensation, without giving the items here required, the award will be invalid; and, upon appeal by either party, may be set aside.

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* These directions will no doubt impose more work upon the valuers, and will demand greater accuracy in the accounts of the farmer; and hence may arise some

The word used throughout the Act in connection with improvements is "execute." In speaking of breach of covenant by landlord or tenant, or of waste by the tenant, the words used are "commit," or "permit." The same phraseology is followed in § 32, requiring that the award shall give particulars: and as the matters referred include the compensation due to landlord as well as tenant (§ 21), it is clear that the particulars to be given include those relating to the landlord's counterclaim on account of breach of covenant and waste, as well as particulars relating to the tenant's claim on account of improvements and breach. Thus, in the event of a landlord's counterclaim in respect of waste or breach, a specification of the "act" or "thing" complained of, and the time at which each was committed or permitted, will disclose, if it relates "to a matter of husbandry," whether it is a proper subject of compensation under the Act, as occurring within four years of the determination of the tenancy (§ 19, sub-sect.). Both tenant and landlord, when furnished with the terms of the award, will be in an equally good position for deciding whether they will dispute it. Besides the particulars which are obligatory under the Act, the award can hardly be reckoned complete unless it distinguishes and specifies the deductions from tenant's compensation for taxes, rates, tithe-rentcharge, and rent (§ 16); and specifies also the nature and money-value of the "benefit" given to a tenant in consideration of his executing the improvement, and pleaded by the landlord as a set-off (§ 17).

Another matter with which the award will usually deal will be the costs of the reference. On this important subject Parliament has given to the referee, or referees, or umpire, the full powers which are possessed by a Court of Equity. They will be governed in deciding upon the question by "the reasonableness or unreasonableness of the claim of either party," whether as to amount or otherwise, and will consider "all the circum-

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of the agent's objections and the tenant's apathy with respect to the working of the Act. At the same time they present no real difficulty, but, I should say, are decidedly more advantageous than the present system of stating a lump sum, which is no guide to the value of the several improvements which have been executed.—*Note by Mr. J. D. Dent.*

stances of the case" (§ 33). They may saddle either party with the whole of the costs, or with as much or as little as they think just. If they decide that the costs shall be paid by the parties in unequal proportions, it will be necessary to set forth this decision in the award. If, however, they are of opinion that each party should pay his own costs, this result may be obtained by making no order as to costs. Accordingly the Act leaves it to the discretion of the referees or umpire to give or withhold any direction as to costs.

Either party has a right to subject the costs to taxation by the Registrar of the County Court, and to appeal to the Judge if dissatisfied with the Registrar's taxation (§ 33, sub-sect. 2). The costs are defined as those "of and attending the reference, including the remuneration of the referee, or referees, and umpire, where the umpire has been required to act, and including other proper expenses" (§ 33).

Appeal from Award.—If no appeal is brought, the award is final (§ 36), and payment of the compensation found due may be enforced in the mode presently to be explained. But the parties may appeal, under certain conditions; and the referees and umpire are treated in this respect as a Court of First Instance, whose decision, if it be thought unsound, may be reviewed elsewhere. Usually a submission to arbitration under statute, or the consequent award, can be questioned by making it a rule of Court; and the rights of the parties thenceforward are determined by litigation in the ordinary way. To prevent the uncertainty and expense of such litigation in the Superior Courts, and to provide a summary and cheap mode of settling disputes arising under the Agricultural Holdings Act, there is an express prohibition of any resort to a Superior Court (§ 35), except upon a point of law under circumstances hereafter to be mentioned.

Jurisdiction of County Court.—The jurisdiction of the County Court between landlord and tenant is not a wholly new one, for by 19 & 20 Vict. c. 108, s. 50, the possession of small tenements may be recovered by landlords, when the rent is under 50*l.* a-year, by a plaint in the County Court of the district in which the premises lie. In cases arising under this Act, neither party can require a jury to be summoned as in other actions; but the Judge decides all questions of law and fact. Either party may obtain from the Registrar a summons for witnesses, and under this summons require the production of deeds, papers, and writings; and these summonses are served by the bailiff.

Under the Agricultural Holdings Act, if the parties, or either of them, are dissatisfied with the decision of the referee, or referees and umpire, they may appeal against the award to the Judge of the County Court on certain specified grounds. According to the Act this right of appeal must be exercised within seven days after delivery of the award (§ 36), but the County Court Orders impose a further practical limit as to time by requiring the appellant to file a copy of the award within four days after delivery, together with a concise statement in writing of his ground of appeal. If an appeal, therefore, be desired, the landlord or tenant has no time to lose; he must make up his mind quickly, and act promptly, or he will lose his opportunity of disputing the award.

Besides the limitation of time, the right of appeal is hedged round by a limitation as to money. If "the sum claimed for compensation" was 50*l.* and under, the decision of the referee, referees, or umpire, is final. Neither party can go to the County Court unless the sum claimed for compensation exceeds 50*l.* (§ 36). The words quoted appear to include a landlord's counter-claim, though the construction is not quite clear. A reasonable construction would be to assume that the right of appeal arises, for instance, if the tenant claims 50*l.* and the landlord 80*l.*, though upon the tenant's claim alone no such right of appeal exists.

A third limitation to the right of appeal relates to the grounds upon which the award is disputed. It can only be disputed upon one of the grounds following (§ 36):—

1. That the award is invalid (§ 36, sub-sect. 1)

2. That compensation has been awarded for improvements, acts, or things, breaches of covenants or agreements, or for committing or permitting waste, in respect of which the party claiming was not entitled to compensation (§ 36, sub-sect. 2).

3. That compensation has not been awarded for improvements, acts, or things, breaches of covenants or agreements, or for committing or permitting waste, in respect of which the party claiming was entitled to compensation (§ 36, sub-sect. 3).

We may suppose that the three limitations in the Act are satisfied, and that a copy of the award has been filed in the County Court, with the "concise statement," which really constitutes the notice of appeal. Henceforward the parties may be spoken of as appellant and respondent, for these are the titles respectively given by the County Court Orders to the party prosecuting the appeal and the party supporting the award under the Act. It is now necessary to go outside the Act to the County Court Orders for information respecting the first stage in the new process. The concise statement should really contain the appellant's case, and it must set out the following particulars:—

1. If the ground of appeal is that the award is invalid, a statement of the several objections to its validity on which the appellant relies.

2. If the ground of appeal is the award of compensation to which the claimant was not entitled (§ 36, sub-sect. 2), a statement showing in respect of what matters compensation is alleged to have been improperly awarded.

3. If the ground of appeal is the non-award of compensation to which the claimant was entitled (§ 36, sub-sect. 3), a statement showing in respect of what matters compensation is alleged to have been improperly withheld.

The Orders further prescribe that no ground of appeal shall be allowed at the trial unless these requirements are complied with. In other words, the appellant will be out of Court unless he not only specifies his ground or grounds of appeal, but supports each ground by particulars. The concise statement must also contain the names, in full, and address both of respondent and appellant, and of the appellant's solicitor, if the proceedings are commenced through a solicitor. The respondent's name and address being thus obtained, the Registrar must, within twenty-four hours after the filing of the concise statement, send a copy by post to the respondent, accompanied by a notice requiring him to deliver to the Registrar a statement in answer within eight days after, not the receipt, but the transmission to him of the appellant's concise statement. The two documents may now be conveniently distinguished as statement and answer. The respondent's answer must be signed by himself or his solicitors and disclose the following matters:—

"(*a.*) Whether he disputes the validity in law of all, or any, and which of the grounds of objection to the award.

"(*b.*) Whether he disputes the truth in fact of all, or any, and which of the grounds of appeal.

"(*c.*) Whether he admits the validity in law, and truth in fact, of all, or any, and which of the grounds of appeal.

"(*d.*) Whether he prays that the case may be remitted to be reheard.

"(*e.*) His name and address, and that of his solicitor, if the statement be delivered through a solicitor."

On receiving the respondent's answer the Registrar must transmit a copy of it and of the award and grounds of appeal to the Judge, who, "as soon as conveniently may be," is to appoint a time and place for the hearing of the appeal, and instruct the Registrar to give notice of such appointment forthwith to the parties. The Judge is to hear and determine the appeal,* and the evidence will be taken and the case conducted like an ordinary County Court suit. The Judge will then finally dispose of the case, or at his discretion may remit it to be reheard in whole or in part by the referee, or referees, or umpire, with such directions as he may think fit (§ 36). If so remitted, it may be assumed that in the absence of judicial directions to the contrary, the case will come back to the County Court for final and formal adjudication. The Judge's order may be enforced in the same manner as any other judgment of the County Court. The following will be the form (County Court Consolidated Orders):—

"In the County Court of [ ] holden at [ ]

"In the matter of the County Court Acts, and

"In the matter of the Agricultural Holdings (England) Act, 1875, and

"In the matter of an appeal by A. B.

"The day of 187 .

"Upon the hearing this day of an appeal by [*name and description of appellant*] against an award dated [*state date*] given under the hand of [*referee's name*] whereby [*state shortly the substance of the award*], and on reading the said awards, and on hearing the said A. B. and C. D., the respondent.

"It is ordered that [*state order, e.g.*:—] the said C. D., do within fourteen days of the date of this order pay to the said A. B. the sum of *l.* and *l.* for costs, and in default of such payments at the time aforesaid the said A. B. may proceed to execution."

The Judge's decision will be final upon the facts, but on a question of law he is bound, at the request of either party, to state a special case for decision by the High Court of Justice (§ 36). Notice of appeal may be given ten days after the trial. It must state the grounds of dissatisfaction with the Judge's ruling, and must be sent by post or otherwise to the Registrar as well as to the successful party. A notice of appeal does not operate as a stay of execution or of proceedings under the decision appealed from, unless the Judge shall otherwise order; but the Registrar will detain the proceeds of any execution which may come into his hands pending such appeal, to abide the event (Consolidated Orders). The judgment of the High Court on the case, and on any question of costs or any other matter, will be conclusive, and the Judge of the County Court must act on it (§ 36).

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* There will be no jury. The Lord Chancellor said, during the debates on the Bill:—"I can conceive nothing more dangerous than to submit differences between landlord and tenant virtually to the decision of tenants residing in the neighbourhood."

It is provided by § 21 that the parties may agree respecting the compensation due to either of them. The terms of such agreement as to the amount, mode, and time of payment should be in writing. The money due under such agreement, or by virtue of any award or appeal-order, must be paid within fourteen days after the time when it is agreed, or awarded, or ordered to be paid. In case of default, the amount may be recovered by obtaining an ordinary County Court order, which will operate in the usual way as a judgment for debt or damages (§ 37).

The costs of proceedings in the County Court, like those of referees and umpire, will be in the discretion of the Court, upon a scale prescribed by the Lord Chancellor, both as to County Court costs proper, and as to the costs of the reference to be taxed by the Registrar (§ 40).

I need only briefly notice the useful legal provisions empowering the County Court, for the purposes of the Act, upon the application of any person interested, to appoint a guardian to represent any landlord or tenant, being an infant without a guardian, or being of unsound mind, not so found by inquisition (§ 38). By the same simple process a "next friend" may be appointed to act for a married woman. For the purposes of the Act, a married woman entitled for her separate use, and not restrained from anticipation, will be in respect of land as if she were unmarried. In the case of any other married woman desirous of doing any act under the statute, her husband's concurrence will be requisite; but the County Court may exercise the powers of the Court of Chancery in examining her apart from him, and ascertaining that she knows the nature and effect of what she proposes to do, and that she is acting freely and voluntarily (§ 39).

CHARGE OF TENANT'S COMPENSATION.

Some general remarks have already been made upon this important part of the Act. The provisions relating to it will now be examined in greater detail. We have seen (§ 37) that whether compensation is awarded under the Act to landlord or to tenant, the money must be paid within fourteen days. It is only upon payment that the landlord can obtain from the County Court a "charge on the holding" in respect of the compensation so paid (§ 42). The creation of such a charge is in the discretion of the Court; and before the order is issued, applicants must first prove the payment, which must be by proper vouchers or evidence, and, secondly, must satisfy the Court "of the observance in good faith of the conditions imposed" by the Act. The object of this requirement is obviously to guard against possible collusion between a needy or unscrupulous limited owner and his tenant, who, by inventing items of compensation for imaginary improvement, or by excessive allowances for actual improvements, might easily swell a claim, and saddle the holding with undue burdens. If the amount of charge applied for has been settled by award, or by order of Court, there will be little risk of such a result; but as the landlord and tenant may agree between themselves upon the amount due to the latter, without employing even a single referee, the danger is not wholly imaginary. The Court in any doubtful case will no doubt call for specific evidence, and in other cases will require *primâ facie* evidence from a limited owner that the charge represents a corresponding benefit to the holding, and that no injustice is thus done to the person entitled in remainder.

The effect of the charge will be to provide for the repayment to the landlord, his executors, administrators, and assignees, of the sum advanced by him as compensation (§ 42, sub-sect. 3). In other words, this sum, sunk in and representing an addition to the value of the soil, does not become absorbed in the realty, but forms part of the personal estate, and is therefore available in favour of younger children. It is left to the discretion of the Court to order repayment of the whole or any part of the money, "with such interest, and by such instalments, and with such directions for giving effect to the charge, as the Court thinks fit" (§ 42, sub-sect. 1).

Duration of Charge.—Upon this point it is necessary to consider the effect of more than one provision in the Act, and the nature of the ownership. If the landlord, at the time when compensation is paid, is absolute owner, the instalments ordered will continue a charge upon the holding throughout any period fixed by the Court, irrespective of the period when the improvements they represent will, under the Act, be exhausted; and till the charge runs out it will affect, not only the landlord's interest, but all subsequent interests, those of purchasers as well as the heir-at-law (§ 44). Care must therefore be taken by purchasers to ascertain whether such charges exist, as they run with the land.

If, on the other hand, the landlord obtaining the charge is not absolute owner of the holding for his own benefit, two limitations will apply to the duration of the charge. There is nothing in the Act to prevent the Judge from ordering, in the case of an absolute owner, that the repayment of the instalments and interest shall be spread over a period of thirty years. But in the case of limited owners, (1) no instalment or interest will be made payable in any event after the expiration of the twenty years, the seven years or the two years during which the respective classes of improvements may be deemed unexhausted under the Act (§ 42, sub-sect. 2). But as the award will state the period of exhaustion, which may fall far short of the maximum periods in the Act, it will be the business of the Judge in each case to limit the duration of the charge to the actual period of the exhaustion, as determined by the award. Again: (2) the charge will cease when the landlord's interest ceases, "where the landlord is himself a tenant of the holding" (§ 44). These words seem to point to cases in which a tenant for life occupies his own land, and makes improvements upon it. The charge for such improvements would cease with his life, and if any instalments remained payable, the remainder-man would get the benefit of them. But the machinery for creating a charge in the earlier part of the Act is limited to agreements or awards as between landlords and tenants, and does not appear to contemplate or provide for improvements executed by the landlord at his discretion upon a holding in his own occupation.

Another limitation upon the amount, as well as the duration, of the charge arises where this part of the Act is incorporated with any lease or special agreement, under the terms of which, or by the custom of the country, the compensation allowed for improvements is more liberal to the tenant than the compensation allowed under the Act. In such cases if, when the agreement is made, the landlord is absolute owner, the charge, both as to amount and duration, may be irrespective of the Act, subject only to the discretion of the Judge. But if, when the agreement is made, the landlord is only a limited owner, the Judge can impose no charge upon the holding, by virtue of the agreement, "greater than, or different in nature or duration from, the charge" which the Act authorises (§ 55, sub-sect.). Subject to the Judge's approval, an absolute owner may take advantage of the Act to impose what burdens he pleases on the land, if he is of opinion that they will enhance its value. If, however, a limited owner wishes to take advantage of the Act for the same purpose, he must be bound by the conditions of the Act, already explained, so far as they relate to the incidence and duration of the charge. As the charge is not to be "greater" than that which may be made under the Act, and as by § 42 the charge is to be in respect of the amount of compensation due to the tenant under the Act, it seems to follow that the compensation given under the agreement must not exceed the compensation which can be awarded under the Act. "Duration" of the charge clearly points to the period found by the award, limited by the maximum periods specified in the compensation sections, and mentioned by reference in § 42, sub-sect. 2. The duration of the charge in respect of improvements executed under a lease or agreement must not, then, exceed the periods of exhaustion assigned to them in the award or in the Act respectively. Lastly, the charge must not be "different in nature," as well as duration, from the charge which might have been made on the holding under the Act in the absence of an agreement; that is, we may assume, the improvements in respect of which the charge is created must not differ in their nature from the improvements specified in the Act.

Having obtained from the County Court a charge on the land in his favour, the landlord, if it is not convenient to him to pay the money out of his own pocket, may assign this charge as security for money lent; and any incorporated Land Improvement Companies are empowered to take such assignment as security for advances by them, and may in their turn assign the charge to third parties (§ 43).

CROWN AND DUCHY LANDS.

The Act applies to, (1) lands belonging to the Queen in right of the Crown, and (2) in right of the Duchy of Lancaster; and, also, (3) to land belonging to the Duchy of Cornwall. The "landlord" representing Her Majesty in respect of (1) Crown lands will be deemed for the purposes of the Act to be the Commissioners of Woods, Forests, or Land Revenues, or one of them, or the proper officer or body having charge of such land for the time being, or some person appointed under the sign manual. The Chancellor of the Duchy of Lancaster for the time being will be deemed the landlord of lands (2); and (3) such person as may be appointed by the Duke of Cornwall, or the personage for the time entitled to the revenues and possessions of the Duchy of Cornwall (§§ 45–47). Tenants upon all these lands, if within the Act, will give notices to these substituted landlords, and otherwise treat with them, as in ordinary cases; and the appointment of referees and umpire, and the powers of the County Court, in the event of dispute, will in like manner be governed by the general provisions of the Act. Special provisions, however, are substituted for those contained in the Act as to the charge of tenant's compensation.

First-class improvements executed by tenants upon (1) Crown lands will be deemed improvements of land within the Crown Lands Act, 1866, sect. 1, and the amount of compensation will be charged, as this section provides, "as a principal sum to the account of the capital of the land revenue of the Crown," the sum so charged being "repaid out of the income of the land revenue of the Crown," as the Treasury may direct. In every such case, however, the repayment of principal out of income must be completed within a period not exceeding thirty years. Any compensation for improvements of the second or third class made by the tenants of Crown lands will be deemed part of the expenses of management of the land revenues of the Crown, and paid out of income accordingly (§ 45, sub-sects. 2 and 3).

In like manner, compensation for first-class improvements executed by tenants under the Agricultural Holdings Act upon land of (2) the Duchy of Lancaster, will be deemed an expense incurred in improving land of the Duchy within 57 Geo. III. c. 97, s. 25, which authorises the Chancellor and Council to sell so much of the funded estate of the Duchy as may be necessary for such improvement. Compensation for improvements of the second and third class will be paid out of the annual revenues of the Duchy. Any compensation payable under the Act to the Chancellor must be lodged with the Receiver-General of the Duchy revenues, and will be applied under the authority of the Duchy of Lancaster Lands Act, 1855, in the purchase of land or of Bank annuities (§ 46 sub-sects. 2, 3, 4).

Compensation for first-class improvements upon land belonging (3) to the Duchy of Cornwall may (under the Duchy of Cornwall Management Act, 1863, § 8) be advanced from the Duchy funds arising from sales and enfranchisements, and charged upon Duchy revenues with a provision for repayment by annual instalments in not less than thirty years (§ 47, sub-sect. 2).

ECCLESIASTICAL AND CHARITY LANDS.

The Act applies also to these lands. The Archbishop or Bishop will, under the Act, be the "landlord" of all lands forming the endowment of a see, but he must not exercise the powers conferred upon landlords by the Act without the previous approval in writing of the Ecclesiastical Commissioners (§ 48). In like manner, where the glebe or other land belonging to a benefice is let, the incumbent as landlord must not assent to improvements by the tenant, or exercise any of the landlord's other powers under the Act, except with the previous written approval of the Governors of Queen Anne's Bounty (§ 49). And they, in turn, before so approving, must give notice of the application to the patron of the benefice, though he can exercise no veto (sub-sect. 3). It is the incumbent, of course, with whom the tenant will have to deal, and it will be for him, if he chooses, to exclude the holding from the operation of the Act. If he obtains the sanction of the Governors to the making of improvements by the tenant, and compensation is claimed, he may, if authorised so to do, obtain from the County Court a charge on the holding in his favour. But the Governors of Queen Anne's Bounty have the option of paying the tenant's compensation on behalf of the incumbent, and they may then obtain from the County Court a charge on the holding in favour of themselves. In either case the charge will be effectual, notwithstanding any change of incumbent (§ 49, sub-sects. 1 and 2). Owners of land in trust for ecclesiastical or charitable purposes must obtain the previous approval in writing of the Charity Commissioners before they exercise the powers conferred upon the landlord by the Act (§ 50).

NOTICE TO QUIT.

In 1874, before Mr. Disraeli became Prime Minister, he told his constituents that, in his opinion, much that was thought unsatisfactory in the existing tenure of land would disappear if a tenant-farmer could be sure of a two-years' notice to surrender his holding.* A considerable advance in this direction is made by § 51, another important provision of the Act. The section is general in its wording, but is of course controlled by § 58, and is therefore limited to agricultural tenancies, with a further limitation to tenancies from year to year, and a still further limitation, namely, that they must be tenancies affected by the Act.

As the law stood before February 14th, supposing a tenant from year to year entered on his holding at Michaelmas, 1875, and the landlord within a few months found him to be an undesirable tenant, his tenancy could be determined by notice given at Lady Day and ending at the Michaelmas following. A half-year's notice expiring with a year of tenancy was necessary, but the Act has extended this period by six months, and requires a year's notice expiring with a year of tenancy. The result is, in certain contingencies, to give a tenant what may be practically equal to two years' possession; for if the tenancy begins to run from Michaelmas, 1876, notice cannot be given under the Act until Michaelmas, 1877, expiring of course at Michaelmas, 1878. There is a proviso which excludes from the benefit of the section tenants who are adjudged bankrupt, or who file a petition for composition or arrangement with their creditors.

Standing alone, § 51 looks more imposing than it really is. The limitations already mentioned take from it the obligation which it seems to create on the one hand, and the benefit it seems to confer on the other. We must always remember, too, that the Act elsewhere, by necessary implication, leaves landlords and tenants free to regulate as they please the time of notice to quit, like every other part of the contract of tenancy (§ 54). The notice-to-quit provision is therefore no more compulsory than any other portion of the Act. Taken in connection with § 56 and § 57, the effect of the provision will be this:—It will apply to every yearly tenancy beginning after February 14, 1876, unless the landlord and tenant agree in writing to exclude the whole Act, or this particular provision. It will also apply to all yearly tenancies existing on February 14, 1876, unless within two months after that date the landlord notifies to the tenant, or *vice versâ*, his desire that the contract of tenancy between them shall remain unaffected by the Act. Thus, in new tenancies from year to year, landlord and tenant must concur in contracting themselves out of this as of the other provisions of the Act, and the tenant will forfeit with his eyes open the advantages intended to be conferred upon him by the Act. It must be repeated that in existing yearly tenancies neither landlord nor tenant alone can adopt, but either can exclude the operation of the Act in respect of notice to quit or otherwise. In both new and existing tenancies it may also be repeated, mutual silence will mean consent; it will be necessary for the parties, if they wish that the Act shall not apply, to record their intention in writing. One result of the statute, therefore, will be to multiply written agreements upon the letting of land, if indeed it does not make written agreements almost universal.*

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* The suggestion was thrown out as an alternative to a plan of compensation for unexhausted improvements; and there is therefore no inconsistency in the shorter term of notice fixed by the Bill, supplementing, as it does, provisions allowing such compensation.

RESUMPTION FOR IMPROVEMENTS.

Another provision, limited, like the last-mentioned, to yearly tenancies, authorises landlords, but only in the case of holdings to which the Act applies, to serve a tenant with notice to quit part only of the holding. This is a power which the landlord does not now possess; but the notice will not be valid, unless the land is required for one of eight purposes here specified (§ 52):—

1. Erecting farm-labourers' cottages or other houses, with or without gardens.
2. Providing gardens for existing farm-labourers' cottages, or other houses.
3. Allotment to labourers of land for gardens or other purposes.

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* "The great advantage of the Bill is, that it will induce the generality of landlords and tenants to make agreements and define their engagements strictly."—(Viscount Portman, Debate on Third Reading, May 13, 1875.)

4. Planting trees.

5. Opening or working any coal, ironstone, limestone, or other mineral; or a stone quarry, clay, sand, or gravel-pit; or constructing any works or buildings to be used in connection therewith.

6. Obtaining brick-earth, gravel, or sand.

7. Making a watercourse or reservoir.

8. Making any road, tramroad, siding, canal, or basin, or any wharf, pier, or other work connected therewith.

In the notice to quit, the landlord must state that he requires the land with a view to use it for one of these purposes. If the tenant thinks that the loss of such part of the land as is covered by the notice depreciates the value of the remainder so greatly as to render the continued occupation of the whole undesirable, he will be able to put an end to his tenancy summarily, by serving the landlord with a written notice that he accepts the notice served on him as notice to quit the entire holding. Such counter-notice by the tenant must be served within a month after service of the landlord's notice, and its effect will be to determine the tenancy at the expiration of the then current year. If the tenant relinquishes the entire holding, his claim to compensation arises and must be made in the usual way under the Act. If he accepts the situation, and relinquishes only the portion of land required by the landlord, the provisions of the Act respecting compensation apply to such portion just as if the tenancy of the whole were determined. He may claim, in respect of the land thus resumed by the landlord:—

(*a.*) The value of any unexhausted improvements made upon it by him.

(*b.*) A proportionate reduction of rent in respect of it. (This seems to mean a reduction based upon the average rent of the holding, and proportioned to the acreage of the land resumed. If the land is specially fertile, or otherwise of exceptional agricultural value, compensation may arise under the words in italics in the next head.)

(*c.*) Reduction of rent representing any depreciation of the value of the residue of the holding to the tenant, *caused by the withdrawal of* the particular land from the holding, or by the use to be made thereof.

Some of the uses contemplated in the section would certainly justify a claim under the head last mentioned. It is of public advantage that the landlord should have an easy mode of resuming land which he intends to apply to useful and beneficial purposes, industrial and otherwise; and the interests of the tenant have been fairly considered. There appears, indeed, to be a slight anomaly in the accompanying provision for finding the compensation due to the tenant in the event of such a severance of his holding as is here contemplated. Having regard, no doubt, to the smallness of the amount at issue, the Act wisely declares that the reduction of rental under heads (*b*) and (*c*), which is to be ascertained by agreement or settled by reference, as in the case of compensation, shall not be subject to appeal to the County Court (§ 52, sub-sect. 2). If, however, the tenant has a claim for unexhausted improvements upon the same bit of land, and the amount claimed is over 50*l.*, there is nothing to prevent him from carrying the claim not only into the County Court, but before the High Court of Justice, upon any question of law (sub-sect. 1).

FIXTURES.

As early as the reign of Edward II. we find the rule laid down in the Year Books (in 1324) that where a lessee or yearly tenant, having annexed anything to the freehold, afterwards takes it away, it is waste. The exception in favour of trade-fixtures is first recorded as being raised in 1369, but is not expressly laid down till 1505. Two hundred years later, Lord Holt, by his decision in Poole's case, placed the privilege of removing trade-fixtures beyond all question. Attempts were soon made to extend to agriculture the exceptions grafted upon the rule; and at one time there seemed to be fair prospect that, by force of judicial decision, farmers would receive the same privileges as had been obtained by persons in trade. In 1694 there is recorded a case tried at Hereford before Lord Chief Justice Treby (Culling *v.* Tufnell), in which a barn erected by a tenant upon pattens and blocks of timber, lying on, but not let into, the land, was held to be removable by the tenant; but the Judge founded his decision on the custom of the country in favour of the tenant, with reference to which it might be presumed that he and his landlord had contracted. In 1799, in the case of Dean *v.* Allalley, the tenant had erected two sheds, called Dutch barns, and had removed them during his term. He was sued on his covenant, by which he undertook to leave in repair all buildings which then were or should be erected on the premises during the term, and Lord Kenyon held that these barns were not included in this description. These barns "had a foundation of brick in the ground, and uprights fixed in and rising from the brickwork and supporting the roof, which was composed of tiles, and the sides open;" and Lord Kenyon justified his decision by the remark that the law would make the most favourable construction for the tenant where he had made necessary and useful erections for the benefit of his trade or manufacture.

At length, in 1803, a case* came before the Court of King's Bench, involving the distinct question whether a tenant-farmer can, before the end of his term, remove from the freehold buildings constructed by him for the ordinary purposes of husbandry and connected with no description of trade. The tenant, who was defendant in the case, held a farm for twenty-one years; and about fifteen years before the term expired he erected, at his own expense, amongst other buildings, a beast-house, a cart-house, and fold-yard. The buildings were of brick and mortar, and tiled, the foundations being about a foot and a-half deep in the ground; they were open to the front and supported by brick pillars. The fold-yard wall was of brick and mortar, and its foundation was in the ground. The defendant, before his lease expired, pulled down the buildings, dug up the foundations, and carried away the materials—leaving the premises in the same state as when he entered upon them. It appeared that the buildings were necessary and convenient for the occupation of the farm, which could not be well managed without them, In an action tried at Lincoln, a verdict had been found for the plaintiff, subject to the point of law; and the question for the opinion of the Court now was: Had the defendant a right to take away the buildings? For the plaintiff, it was argued that their removal was waste at Common Law, and that the exceptions to the rule did not touch agriculture, but had been introduced solely for the benefit of trade. Buildings like those erected by the defendant, it was argued, "are not in their nature temporary or movable, but are calculated solely for the enjoyment of the land. The expense of erecting them is great, and their value is great on the spot, but of trifling consideration when removed. The injury of their removal, therefore, is much greater to the landlord than the benefit of the materials, when removed, is to the tenant. If the exception were extended to buildings erected for the purposes of agriculture, it would be as extensive as the rule itself, and would therefore destroy it. The sole object of such erections is for the purpose of enjoying the produce of the land. The land, therefore, is the principal; the buildings are the accessory to the land. There is thus an essential distinction between buildings used in agriculture and buildings erected for engines or machinery used in trade, where the personal chattel is the principal."

For the defendant, it was contended that the object of gradually relaxing the old rule of law between landlord and tenant had been to encourage tenants to lay out their money in the improvement of the premises, and in making their industry as productive as possible, which is for the benefit of the State as well as the individual. "This object applies at least as strongly to tenants in husbandry as in trade. Agriculture, in the improved state in which it is now carried on, is in itself a trade; it requires a much larger capital than formerly, and the use of more expensive implements and machinery. Without the aid of modern improvements, the land cannot be made so productive as it otherwise may be, nor the produce so well preserved and brought to market. But unless the tenant is entitled to take away with him, at the end of his term, or have a compensation in value for, buildings like these in question, erected in such a manner as to be capable of being removed at pleasure and set up on any other farm, he will not be at the expense of erecting them at all; and, therefore, though he, and through him the public, will suffer, yet the landlord will not be the better for the right which he now claims. This is no question whether permanent additions or improvements made by a tenant to an old dwelling-house or out-buildings, or even to new ones erected by him for his personal accommodation, can be removed at the end of the term; for not even persons renting premises for the purpose of carrying on trades have any such privileges. It is a question whether buildings erected for the sole purpose and convenience of carrying on the farm—that is, of turning to the best account the capital and industry of the farmer in his trade or business—may not be removed by him. In this respect there is no distinction between trade and agriculture. The fair conclusion from the old authorities is, that whatever buildings are erected by a tenant (be the materials what they may, or however placed in or upon the ground) for the immediate purposes of his trade, or for the more advantageous working of his farm, he may remove them again, provided he leave the premises on his quitting as he found them. According to this rule, no injury could ensue to the landlord, whose property would, on the contrary, be eventually improved by the better cultivation of it, while the public would derive an immediate advantage from the encouragement afforded to the capital and industry of the tenant."

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* Elwes v. Mawe, 2 Smith's Leading Cases, 141.

This case, occurring more than seventy years ago, is of some historic interest now; and the arguments on the defendant's behalf correctly epitomise those which were advanced much later in advocating the right of tenant-farmers to compensation for permanent or temporary improvements made by them. If the Court of King's Bench had taken Lord Kenyon's view of the law, and the policy of the law, and had decided in the defendant's favour, much of the later agitation, and some of the more recent legislation, with respect to agricultural improvements, would have been unnecessary. The Court, however, by the mouth of Lord Ellenborough, were unanimously of opinion that the defendant had no right to remove the buildings. The Lord Chief Justice declined to recognise the authority of Dean *v.* Allalley, which was a *Nisi Prius* case, and did not undergo subsequent review by Lord Kenyon and the rest of the Court. "Lord Kenyon," he said, "certainly seems to have thought that buildings erected by tenants for the purposes of farming were, or rather ought to be, governed by the same rules which had been so long judicially held to apply in the case of buildings for the purposes of trade." But Lord Ellenborough was of opinion, that to give effect to this doctrine would be to establish a dangerous innovation in the relations of landlord and tenant, and would be "contrary to the uniform current of legal authorities."

Act of 1851 *as to Fixtures.*—So the law remained until the passing of 14 & 15 Vict. c. 25, which provided that, after July 24, 1851, all farm and other buildings, engines, or machinery erected or put up by a tenant, at his own expense, for agricultural purposes, or purposes of trade and agriculture, should be the property of such tenant, and removable by him, notwithstanding they might be separate buildings, or permanently affixed to the soil. This right, however, was made subject to the following conditions:—(1) The landlord's consent in writing must have been obtained previous to the erection. (2) The buildings or machinery must not have been erected or put up in pursuance of some obligation on that behalf. (3) In the course of removal the tenant must not injure the landlord's premises, which must be put "in like or as good plight and condition as the same were in before the erection of the things so removed." (4) Before removal, the tenant must give to the landlord, or his agent, a month's notice in writing of his intention, and if the landlord elects to purchase, the tenant's right of removal ceases. The value of the tenant's buildings, &c., is to be ascertained by two referees (one chosen by each party) or their umpire, and is to be paid or allowed in account by the landlord.

Buildings and Steam-Engines.—The Agricultural Holdings Act goes a step, though, perhaps, but a short step, further in the same direction. It does not change the principle of the existing law as to *buildings* erected for agricultural purposes at the tenant's cost. Such buildings, upon holdings not affected by the new Act, remain subject to the Act of 1851; and in either case the landlord's previous written consent is still necessary to give the tenant the qualified property in them which that Act recognises, or to create a valid claim to compensation under the new Act. So, also, the tenant, before erecting any steam-engine, must still give the landlord written notice of his intention. If the landlord assents, or is even silent, the tenant may go on, and his rights under the Agricultural Holdings Act will then arise in respect of the steam-engine. If, however, the landlord, on receiving notice of the intention to erect a steam-engine, objects, in writing, to such erection, the tenant will proceed at his own risk; the new Act will no longer protect him; and his rights, whatever they may be, will depend upon custom or otherwise (§ 53, concluding sub-sect.).

Engines, Machinery, &c.—Engines and machinery, unlike buildings, are not found among any one of the three classes of improvements, but are more properly treated as fixtures; and the distinction in the Act between the two kinds of interests created by the tenant, and here recognised by the Legislature, is that the specified improvements in classes one, two, and three, are treated as inseparably annexed to the soil, as in fact they are—buildings, to a modified extent, excepted—and as therefore properly the subjects of compensation by the owner of the soil; while fixtures are removable, and need not necessarily therefore be the subjects of compensation. The old maxim of law, however, is still applied to both improvements and fixtures. Being annexed to the land, both become the property of the landlord upon payment of their fair value. The tenant cannot pull down the buildings erected at his cost, and cart off the materials; he cannot say of the fixtures, "I will not sell—I have a use for them elsewhere." The landlord may take them at his option.

We have seen that the effect of the Act of 1851 was to give the tenant certain rights of property in engines or machinery erected at his cost, with the previous consent of the landlord. The Agricultural Holdings Act dispenses with the necessity of procuring the landlord's previous consent for affixing to the holding this class of fixtures, steam-engines excepted. In the absence, be it always understood, of express agreement, or of written exclusion of the Act from the contract of tenancy, an agricultural tenant, whose holding exceeds two acres, may affix to his holding, after February 14, 1876, "any engine, machinery, or other fixture, for which he is not under this Act or otherwise entitled to compensation." These fixtures may be put up not only without the assent, but contrary to the express wishes of the landlord; and, if they have not been so put up pursuant to some obligation, or instead of some fixture belonging to the landlord, they will become the property of the tenant, and be removable by him, upon the following conditions (§ 53):—

1. Before removing any fixture, the tenant must pay all rent owing by him, and perform all other obligations to the landlord in respect of the holding. The landlord, in fact, has a lien upon the fixtures for the amount of rent or compensation.

2. In removing any fixture, no "avoidable damage" must be done to any building, or other part of the holding.

3. Immediately after removing any fixture, the tenant must make good all damage occasioned by such removal.

4. The tenant cannot remove any fixture unless he gives the landlord one month's previous notice, in writing, of the intended removal.

5. At any time within the month of notice, the landlord (as under the Act of 1851) has an option of purchasing any fixture comprised in the notice of removal. He may thus select which he thinks worth purchase, and leave the tenant to remove the rest. This option must be signified to the tenant, in writing, before the end of the month; and the fixture selected by the landlord becomes his property, and must be left by the tenant, who will be paid for it according to its fair value to an incoming tenant. If the parties differ, the value is to be settled by reference, but without power of appeal; the decision of the referee, or referees, and umpire, will be final.

This is the Statute which the Legislature have passed, recognising the just confidence reposed in most English landlords by their tenantry, but recognising, too, in the words of the Prime Minister, that "laws should be founded, not on honour, but on justice." One advantage possessed by the Act is, that it does not refer you to other Acts in order to gather its meaning; the law, so far as it depends on statute, is for the most part contained in the four corners of the Act itself. It is hardly reasonable to expect that a statute dealing with so many questions, and entering into so many details, should be free from doubt in all its parts; nor does this Paper pretend to discover or solve the numerous points which may be raised upon the meaning and bearing of particular sections. To enter into more minute detail, however, would be only to bewilder instead of making clear. The explanation which has been here attempted will perhaps enable readers of the 'Journal' to understand the general features of the new law. The measure will soon be practically tested; and any defects found to exist in its machinery may easily be remedied. Meanwhile it marks a new point of departure in agriculture, and may come to be regarded, a generation or two hence, as a measure of far higher value and importance than it seems to be to-day.

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AGRICULTURAL HOLDINGS (ENGLAND) ACT.

[38 & 39 Vict. Ch. 92.]

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An Act for amending the Law relating to Agricultural Holdings in England. [13th August, 1875.]

Be it enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

PRELIMINARY.

Short Title.

1. This Act may be cited as The Agricultural Holdings (England) Act, 1875.

Commencement of Act.

2. This Act shall commence from and immediately after the fourteenth day of February, one thousand eight hundred and seventy-six.

Extent of Act.

3. This Act shall not extend to Scotland or Ireland.

Interpretation.

4. In this Act—

"Contract of tenancy" means a letting of land for a term of years, or for lives, or for lives and years, or from year to year, or at will:

"Determination of tenancy" means the cesser of a contract of tenancy by reason of effluxion of time, or from any other cause:

"Landlord" means the person for the time being entitled to possession of land subject to a contract of tenancy, or entitled to receipt of rent reserved by a contract of tenancy, whatever be the extent of his interest, and although the land or his interest therein is encumbered or charged by himself or his settlor, or otherwise, to any extent; the party to a contract of tenancy under which land is actually occupied being alone deemed to be the landlord in relation to the actual occupier:

"Tenant" means the holder of land under a contract of tenancy:

"Landlord" or "tenant" includes the agent authorised in writing to act under this Act generally, or for any special purpose, and the executors, administrators, assigns, husband, guardian, committee of the estate, or trustees in bankruptcy, of a landlord or tenant:

"Holding," includes all land held by the same tenant of the same landlord for the same term under the same contract of tenancy.

"Absolute owner" means the owner or person capable of disposing, by appointment or otherwise, of the fee simple or whole interest of or in freehold, copyhold, or leasehold land, although the land or his interest therein is mortgaged, encumbered, or charged to any extent:

"County Court," in relation to a holding, means the County Court within the district whereof the holding or the larger part thereof is situate:

"Person" includes a body of persons and a corporation aggregate or sole.

The designations of landlord and tenant shall, for the purposes of this Act, continue to apply to the parties to a contract of tenancy until the conclusion of any proceedings taken under this Act on the determination of the tenancy.

COMPENSATION.

Tenant's Title to Compensation.

5. Where, after the commencement of this Act, a tenant executes on his holding an improvement comprised in either of the three classes following:

FIRST CLASS.

Drainage of land.
Erection or enlargement of buildings.
Laying down of permanent pasture.
Making and planting of osier beds.
Making of water meadows or works of irrigation.
Making of gardens.
Making or improving of roads or bridges.
Making or improving of water-courses, ponds, wells, or reservoirs, or of works for supply of water for agricultural or domestic purposes.
Making of fences.
Planting of hops.
Planting of orchards.
Reclaiming of waste land.
Warping of land.

SECOND CLASS.

Boning of land with undissolved bones.
Chalking of land.
Clay-burning.
Claying of land.
Liming of land.
Marling of land.

THIRD CLASS.

Application to land of purchased artificial or other purchased manure.
Consumption on the holding by cattle, sheep, or pigs of cake or other feeding-stuff not produced on the holding.

he shall be entitled, subject to the provisions of this Act, to obtain, on the determination of the tenancy, compensation in respect of the improvement.

Time in which Improvement exhausted.

6. An improvement shall not in any case be deemed, for the purposes of this Act, to continue unexhausted beyond the respective times following after the year of tenancy in which the outlay thereon is made:

Where the improvement is of the first class, the end of twenty years:
Where it is of the second class, the end of seven years:
Where it is of the third class, the end of two years.

Amount of Tenant's Compensation in First Class.

7. The amount of the tenant's compensation in respect of an improvement of the first class shall, subject to the provisions of this Act, be the sum laid out by the tenant on the improvement, with a deduction of a proportionate part thereof for each year while the tenancy endures after the year of tenancy in which the outlay is made and while the improvement continues unexhausted; but so that where the landlord was not, at the time of the consent given to the execution of the improvement, absolute owner of the holding for his own benefit, the amount of the compensation shall not exceed a capital sum fairly representing the addition which the improvement, as far as it continues unexhausted at the determination of the tenancy, then makes to the letting value of the holding.

Amount of Tenant's Compensation in Second Class.

8. The amount of the tenant's compensation in respect of an improvement of the second class shall, subject to the provisions of this Act, be the sum properly laid out by the tenant on the improvement, with a deduction of a proportionate part thereof for each year while the tenancy endures after the year of tenancy in which the outlay is made and while the improvement continues unexhausted.

Amount of Tenant's Compensation in Third Class.

9. The amount of the tenant's compensation in respect of an improvement of the third class shall, subject to the provisions of this Act, be such proportion of the sum properly laid out by the tenant on the improvement as fairly represents the value thereof at the determination of the tenancy to an incoming tenant.

Consent of Landlord for First Class.

10. The tenant shall not be entitled to compensation in respect of an improvement of the first class, unless he has executed it with the previous consent in writing of the landlord.

Deduction in First Class for Want of Repair, &c.

11. In the ascertainment of the amount of the tenant's compensation in respect of an improvement of the first class, there shall be taken into account, in reduction thereof, any sum reasonably necessary to be expended for the purpose of putting the same into tenantable repair or good condition.

Notice to Landlord for Second Class.

12. The tenant shall not be entitled to compensation in respect of an improvement of the second class, unless, not more than forty-two and not less than seven days before beginning to execute it, he has given to the landlord notice in writing of his intention to do so, nor where it is executed after the tenant has given or received notice to quit, unless it is executed with the previous consent in writing of the landlord.

Exclusion of Compensation in Third Class after exhausting Crop.

13. The tenant shall not be entitled to compensation in respect of an improvement of the third class, where, after the execution thereof, there has been taken from the portion of the holding on which the same was executed, a crop of corn, potatoes, hay, or seed, or any other exhausting crop.

Exclusion of Compensation for Consumption of Cake, &c., in Certain Cases.

14. The tenant shall not be entitled to compensation in respect of an improvement of the third class, consisting in the consumption of cake or other feeding-stuff, where, under the custom of the country or an agreement, he is entitled to and claims payment from the landlord or incoming tenant in respect of the additional value given by that consumption to the manure left on the holding at the determination of the tenancy.

Restrictions as to Third Class.

15. In the ascertainment of the amount of compensation in respect of an improvement of the third class,—

(1.) There shall not be taken into account any larger outlay during the last year of the tenancy than the average amount of the tenant's outlay for like purposes during the three next preceding years of the tenancy, or other less number of years for which the tenancy has endured; and,

(2.) There shall be deducted the value of the manure that would have been produced by the consumption on the holding of any hay, straw, roots, or green crops sold off the holding within the last two years of the tenancy or other less time for which the tenancy has endured, except as far as a proper return of manure to the holding has been made in respect of such produce sold off.

Deductions from Compensation for Taxes, Rent, &c.

16. The amount of the tenant's compensation shall be subject to the following deductions:

(1.) For taxes, rates, and tithe-rentcharge due or becoming due in respect of the holding to which the tenant is liable as between him and the landlord:

(2.) For rent due or becoming due in respect of the holding:

(3.) For the landlord's compensation under this Act.

Set-off of Benefit to Tenant.

17. In the ascertainment of the amount of the tenant's compensation there shall be taken into account in reduction thereof any benefit which the landlord has given or allowed to the tenant in consideration of the tenant executing the improvement.

Tenant's Compensation for Breach of Covenant.

18. Where a landlord commits a breach of covenant or other agreement connected with the contract of tenancy, and the tenant claims under this Act compensation in respect of an improvement, then the tenant shall be entitled to obtain, on the determination of the tenancy, compensation in respect of the breach, subject and according to the provisions of this Act.

Landlord's Title to Compensation.

19. Where a tenant commits or permits waste, or commits a breach of a covenant or other agreement connected with the contract of tenancy, and the tenant claims compensation under this Act in respect of an improvement, then the landlord shall be entitled, by counter-claim, but not otherwise, to obtain, on the determination of the tenancy, compensation in respect of the waste or breach, subject and according to the provisions of this Act.

But nothing in this section shall enable a landlord to obtain under this Act compensation in respect of waste or a breach committed or permitted in relation to a matter of husbandry more than four years before the determination of the tenancy.

PROCEDURE.

Notice of Intended Claim.

20. Notwithstanding anything in this Act, a tenant shall not be entitled to compensation under this Act unless one month at least before the determination of the tenancy he gives notice in writing to the landlord of his intention to make a claim for compensation under this Act.

Where a tenant gives such a notice the landlord may, before the determination of the tenancy, or within fourteen days thereafter, give a counter-notice in writing to the tenant of his intention to make a claim for compensation under this Act.

Every such notice and counter-notice shall state, as far as reasonably may be, the particulars of the intended claim.

Compensation agreed or settled by Reference.

21. The landlord and the tenant may agree on the amount and mode and time of payment of compensation to be paid to the tenant or to the landlord under this Act.

If in any case they do not so agree the difference shall be settled by a reference.

Appointment of Referee or Referees and Umpire.

22. Where there is a reference under this Act, a referee, or two referees and an umpire, shall be appointed as follows:

(1.) If the parties concur, there may be a single referee appointed by them jointly:

(2.) If before award the single referee dies or becomes incapable of acting, or for seven days after notice from the parties, or either of them, requiring him to act, fails to act, the proceedings shall begin afresh, as if no referee had been appointed:

(3.) If the parties do not concur in the appointment of a single referee, each of them shall appoint a referee:

(4.) If before award one of two referees dies or becomes incapable of acting, or for seven days after notice from either party requiring him to act fails to act, the party appointing him shall appoint another referee:

(5.) Notice of every appointment of a referee by either party shall be given to the other party:

(6.) If for fourteen days after notice by one party to the other to appoint a referee, or another referee, the other party fails to do so, then, on the application of the party giving notice, the County Court shall within fourteen days appoint a competent and impartial person to be a referee:

(7.) Where two referees are appointed, then (subject to the provisions of this Act) they shall before they enter on the reference appoint an umpire:

(8.) If before award an umpire dies or becomes incapable of acting, the referees shall appoint another umpire:

(9.) If for seven days after request from either party the referees fail to appoint an umpire, or another umpire, then, on the application of either party, the County Court shall within fourteen days appoint a competent and impartial person to be the umpire:

(10.) Every appointment, notice, and request under this section shall be in writing.

Requisition for Appointment of Umpire by Inclosure Commissioners, &c.

23. Provided, that where two referees are appointed, an umpire may be appointed as follows:

(1.) If either party, on appointing a referee, requires, by notice in writing to the other, that the umpire shall be appointed by the Inclosure Commissioners for England and Wales, then the umpire, and any successor to him, shall be appointed, on the application of either party, by those Commissioners:

(2.) In every other case, if either party, on appointing a referee, requires, by notice in writing to the other, that the umpire shall be appointed by the County Court, then, unless the other party dissents by notice in writing therefrom, the umpire, and any successor to him, shall, on the application of either party, be so appointed, and in case of such dissent, the umpire, and any successor to him, shall be appointed, on the application of either party, by the Inclosure Commissioners for England and Wales.

Exercise of Powers of County Court.

24. The powers of the County Court under this Act, relative to the appointment of a referee or umpire shall be exercisable by the Judge of the Court having jurisdiction, whether he is without or within his district, and may, by consent of the parties, be exercised by the Registrar of the Court.

Mode of Submission to Reference.

25. The delivery to a referee of his appointment shall be deemed a submission to a reference by the party delivering it; and neither party shall have power to revoke a submission, or the appointment of a referee, without the consent of the other.

Power for Referee, &c., to require Production of Documents, Administer Oaths, &c.

26. The referee or referees or umpire may call for the production of any sample, or voucher or other document, or other evidence which is in the possession or power of either party, or which either party can produce, and which to the referee or referees or umpire seems necessary for determination of the matters referred, and may take the examination of the parties and witnesses on oath, and may administer oaths and take affirmations; and if any person so sworn or affirming wilfully and corruptly gives false evidence he shall be guilty of perjury.

Power to proceed in Absence.

27. The referee or referees or umpire may proceed in the absence of either party where the same appears to him or them expedient, after notice given to the parties.

Form of Award.

28. The award shall be in writing, signed by the referee or referees or umpire.

Time for Award of Referee or Referees.

29. A single referee shall make his award ready for delivery within twenty-eight days after his appointment.

Two referees shall make their award ready for delivery within twenty-eight days after the appointment of the last appointed of them, or within such extended time (if any) as they from time to time jointly fix by writing under their hands, so that they make their award ready for delivery within a time not exceeding in the whole forty-nine days after the appointment of the last appointed of them.

Reference to and Award by Umpire.

30. Where two referees are appointed and act, if they fail to make their award ready for delivery within the time aforesaid, then, on the expiration of that time, their authority shall cease, and thereupon the matters referred to them shall stand referred to the umpire.

The umpire shall make his award ready for delivery within twenty-eight days after notice in writing given to him by either party or referee of the reference to him, or within such extended time (if any) as the Registrar of the County Court from time to time appoints, on the application of the umpire or of either party, made before the expiration of the time appointed by or extended under this section.

Duration of Improvement to be found.

31. The award shall find and state the time at which each improvement, in respect whereof compensation is awarded, is taken, for the purposes of the award, to be exhausted.

Award to give Particulars.

32. The award shall not award a sum generally for compensation, but shall, as far as reasonably may be, specify—

The several improvements, acts, and things in respect whereof compensation is awarded;

The time at which each thereof was executed, committed, or permitted;

In the case of an improvement of the first class, where the landlord was not at the time of the consent given to the execution thereof absolute owner of the holding for his own benefit, the extent to which the improvement adds to the letting value of the holding;

The sum awarded in respect of each improvement, act, or thing; and

The sum laid out by the tenant on each improvement.

Costs of Reference.

33. The costs of and attending the reference, including the remuneration of the referee or referees and umpire, where the umpire has been required to act, and including other proper expenses, shall be borne and paid by the parties in such proportion as to the referee or referees or umpire appears just, regard being had to the reasonableness or unreasonableness of the claim of either party in respect of amount or otherwise, and to all the circumstances of the case.

The award may direct the payment of the whole or any part of the costs aforesaid by the one party to the other.

The costs aforesaid shall be subject to taxation by the Registrar of the County Court, on the application of either party, but that taxation shall be subject to review by the Judge of the County Court.

Day for Payment.

34. The award shall fix a day, not sooner than one month after the delivery of the award, for the payment of money awarded for compensation, costs, or otherwise.

Submission not to be Removable, &c.

35. A submission or award shall not be made a rule of any Court, or be removable by any process into any Court, and an award shall not be questioned otherwise than as provided by this Act.

Appeal to County Court.

36. Where the sum claimed for compensation exceeds fifty pounds, either party may, within seven days after delivery of the award, appeal against it to the Judge of the County Court on all or any of the following grounds:

1. That the award is invalid;
2. That compensation has been awarded for improvements, acts, or things, breaches of covenants or agreements, or for committing or permitting waste, in respect of which the party claiming was not entitled to compensation;
3. That compensation has not been awarded for improvements, acts, or things, breaches of covenants or agreements, or for committing or permitting waste, in respect of which the party claiming was entitled to compensation;

and the Judge shall hear and determine the appeal, and may, in his discretion, remit the case to be reheard as to the whole or any part thereof by the referee or referees or umpire, with such directions as he may think fit.

If no appeal is so brought, the award shall be final.

The decision of the Judge of the County Court on appeal shall be final, save that the Judge shall, at the request of either party, state a special case on a question of law for the judgment of the High Court of Justice, and the decision of the High Court on the case, and respecting costs and any other matter connected therewith, shall be final, and the Judge of the County Court shall act thereon.

Recovery of Compensation.

37. Where any money agreed or awarded or ordered on appeal to be paid for compensation, costs, or otherwise, is not paid within fourteen days after the time when it is agreed or awarded or ordered to be paid, it shall be recoverable, upon order made by the Judge of the County Court as money ordered by a County Court under its ordinary jurisdiction to be paid is recoverable.

Appointment of Guardian.

38. Where a landlord or tenant is an infant without a guardian, or is of unsound mind, not so found by inquisition, the County Court, on the application of any person interested, may appoint a guardian of the infant or person of unsound mind for the purposes of this Act, and may change the guardian if and as occasion requires.

Provisions respecting Married Women.

39. The County Court may appoint a person to act as the next friend of a married woman for the purposes of this Act, and may remove or change that next friend if and as occasion requires.

A married woman entitled for her separate use and not restrained from anticipation, shall, for the purposes of this Act, be in respect of land as if she was unmarried.

Where any other married woman is desirous of doing any act under this Act, her husband's concurrence shall be requisite, and she shall be examined apart from him by the County Court, or by the Judge of the County Court for the place where she for the time being is, touching her knowledge of the nature and effect of the intended act, and it shall be ascertained that she is acting freely and voluntarily.

Costs in County Court.

40. The costs of proceedings in the County Court under this Act shall be in the discretion of the Court.

The Lord Chancellor may from time to time prescribe a scale of costs for those proceedings, and of costs to be taxed by the Registrar of the Court.

Service of Notice, &c.

41. Any notice, request, demand, or other instrument under this Act may be served on the person to whom it is to be given, either personally or by leaving it for him at his last known place of abode in England, or by sending it through the post in a registered letter addressed to him there; and if so sent by post it shall be deemed to have been served at the time when the letter containing it would be delivered in ordinary course; and in order to prove service by letter it shall be sufficient to prove that the letter was properly addressed and posted, and that it contained the notice, request, demand, or other instrument to be served.

CHARGE OF TENANT'S COMPENSATION.

Power for Landlord, on paying Compensation, to obtain Charge.

42. A landlord, on paying to the tenant the amount of compensation due to him under this Act, may obtain from the County Court a charge on the holding in respect thereof.

The Court shall have power, on proof of the payment, and on being satisfied of the observance in good faith by the parties of the conditions imposed by this Act, to make an order charging the holding with repayment of the amount paid, or any part thereof, with such interest, and by such instalments, and with such directions for giving effect to the charge, as the Court thinks fit.

But, where the landlord obtaining the charge is not absolute owner of the holding for his own benefit, no instalment or interest shall be made payable after the time when the improvement in respect whereof compensation is paid will, for the purposes of this Act, be taken to be exhausted.

The instalments and interest shall be charged in favour of the landlord, his executors, administrators, and assigns.

Advance made by a Company for the Improvement of Land.

43. Any company now or hereafter incorporated by Parliament, and having power to advance money for the improvement of land, may take an assignment of any charge made by a County Court under the provisions of this Act, upon such terms and conditions as may be agreed upon between such company and the person entitled to such charge; and such company may assign any charge so acquired by them to any person or persons whomsoever.

Duration of Charge.

44. The sum charged by the order of a County Court under this Act shall be a charge on the holding for the landlord's interest therein, and for all interests therein subsequent to that of the landlord; but so that the charge shall not extend beyond the landlord's interest where the landlord is himself a tenant of the holding.

CROWN AND DUCHY LANDS.

Application of Act to Crown Lands.

45. This Act shall extend and apply to land belonging to Her Majesty the Queen, her heirs and successors, in right of the Crown.

With respect to such land, for the purposes of this Act, the Commissioners of Her Majesty's Woods, Forests, and Land Revenues, or one of them, or other the proper officer or body having charge of such land for the time being, or in case there is no such officer or body, then such person as Her Majesty, her heirs or successors, may appoint in writing under the Royal Sign Manual, shall represent Her Majesty, her heirs and successors, and shall be deemed to be the landlord.

Any compensation payable under this Act by the Commissioners of Her Majesty's Woods, Forests, and Land Revenues, or either of them, in respect of an improvement of the first class, shall be deemed to be payable in respect of an improvement of land within section one of the Crown Lands Act, 1866, and the amount thereof shall be charged and repaid as in that section provided with respect to the costs, charges, and expenses therein mentioned.

Any compensation payable under this Act by those Commissioners, or either of them, in respect of an improvement of the second class, or of the third class, shall be deemed to be part of the expenses of the management of the Land Revenues of the Crown, and shall be payable by those Commissioners out of such money and in such manner as the last-mentioned expenses are by law payable.

Application of Act to Land of Duchy of Lancaster.

46. This Act shall extend and apply to land belonging to Her Majesty, her heirs and successors, in right of the Duchy of Lancaster.

With respect to such land, for the purposes of this Act, the Chancellor for the time being of the Duchy shall represent Her Majesty, her heirs, and successors, and shall be deemed to be the landlord.

The amount of any compensation payable under this Act by the Chancellor of the Duchy in respect of an improvement of the first class shall be deemed to be an expense incurred in improvement of land belonging to Her Majesty, her heirs or successors, in right of the Duchy within section twenty-five of the Act of the fifty-seventh year of King George the Third, chapter ninety-seven, and shall be raised and paid as in that section provided with respect to the expenses therein mentioned.

The amount of any compensation payable under this Act by the Chancellor of the Duchy in respect of an improvement of the second class or of the third class shall be paid out of the annual revenues of the Duchy.

The amount of any compensation payable under this Act to the Chancellor of the Duchy shall be paid into the hands of the Receiver General of the revenues of the Duchy, or of his sufficient deputy or deputies; and receipts shall be given by him or them for the same; and the same shall be applied as purchase money for land sold under The Duchy of Lancaster Lands Act, 1855, is applicable under section two of that Act.

Application of Act to Land of Duchy of Cornwall.

47. This Act shall extend and apply to land belonging to the Duchy of Cornwall.

With respect to such land, for the purposes of this Act, such person as the Duke of Cornwall for the time being, or other the personage for the time being entitled to the revenues and possessions of the Duchy of Cornwall, from time to time, by sign manual, warrant, or otherwise, appoints, shall represent the Duke of Cornwall, or other the personage aforesaid, and be deemed to be the landlord, and may do any act or thing under this Act which a landlord is authorised or required to do thereunder.

Any compensation payable under this Act by the Duke of Cornwall, or other the personage aforesaid, in respect of an improvement of the first class, shall be deemed to be payable in respect of an improvement of land within section eight of The Duchy of Cornwall Management Act, 1863, and the amount thereof may be advanced and paid from the money mentioned in that section, subject to the provision therein made for repayment of sums advanced for improvements.

ECCLESIASTICAL AND CHARITY LANDS.

Landlord, Archbishop, or Bishop.

48. Where lands are assigned or secured as the endowment of a see, the powers by this Act conferred on a landlord shall not be exercised by the archbishop or bishop, in respect of those lands, except with the previous approval in writing of the Estates Committee of the Ecclesiastical Commissioners for England.

Landlord, Incumbent of Benefice.

49. Where a landlord is incumbent of an ecclesiastical benefice, the powers by this Act conferred on a landlord shall not be exercised by him in respect of the glebe land or other land belonging to the benefice, except with the previous approval in writing of the Governors of Queen Anne's Bounty (that is, the Governors of the Bounty of Queen Anne for the Augmentation of the Maintenance of the Poor Clergy).

In every such case the Governors of Queen Anne's Bounty may, if they think fit, on behalf of the incumbent, out of any money in their hands, pay to the tenant the amount of compensation due to him under this Act; and thereupon they may, instead of the incumbent, obtain from the County Court a charge on the holding, in respect thereof, in favour of themselves.

Every such charge shall be effectual, notwithstanding any change of the incumbent.

The Governors of Queen Anne's Bounty, before granting their approval in any case under this section, shall give notice of the application for their approval to the patron of the benefice (that is, the person, officer, or authority who, in case the benefice were then vacant, would be entitled to present thereto).

Landlord, Charity Trustees, &c.

50. The powers by this Act conferred on a landlord shall not be exercised by trustees for ecclesiastical or charitable purposes except with the previous approval in writing of the Charity Commissioners for England and Wales.

NOTICE TO QUIT.

Time of Notice to Quit.

51. Where a half-year's notice, expiring with a year of tenancy, is by law necessary and sufficient for determination of a tenancy from year to year, a year's notice so expiring shall by virtue of this Act be necessary and sufficient for the same; but nothing in this section shall extend to a case where the tenant is adjudged bankrupt, or has filed a petition for a composition or arrangement with his creditors.

RESUMPTION FOR IMPROVEMENTS.

Resumption of Possession for Cottages, &c.

52. Where on a tenancy from year to year a notice to quit is given by the landlord with a view to the use of land for any of the following purposes,—

The erection of farm labourers' cottages or other houses, with or without gardens;
The providing of gardens for existing farm labourers' cottages or other houses;
The allotment for labourers of land for gardens or other purposes;
The planting of trees;
The opening or working of any coal, ironstone, limestone, or other mineral; or of a stone quarry, clay, sand, or gravel pit; or the construction of any works or buildings to be used in connection therewith;
The obtaining of brick-earth, gravel, or sand;
The making of a watercourse or reservoir;
The making of any road, tramroad, siding, canal, or basin, or any wharf, pier, or other work connected therewith;

and the notice to quit so states, then it shall, by virtue of this Act, be no objection to the notice that it relates to part only of the holding.

In every such case the provisions of this Act respecting compensation shall apply as on determination of a tenancy in respect of an entire holding.

The tenant shall also be entitled to a proportionate reduction of rent in respect of the land comprised in the notice to quit, and in respect of any depreciation of the value to him of the residue of the holding, caused by the withdrawal of that land from the holding or by the use to be made thereof; and the amount of that reduction shall be ascertained by agreement or settled by reference under this Act, as in case of compensation (but without appeal).

The tenant shall further be entitled, at any time within twenty-eight days after service of the notice to quit, to serve on the landlord a notice in writing to the effect that he (the tenant) accepts the same as a notice to quit the entire holding, to take effect at the expiration of the then current year of tenancy; and the notice to quit shall have effect accordingly.

FIXTURES.

Tenant's Property in Fixtures, Machinery, &c.

53. Where after the commencement of this Act a tenant affixes to his holding any engine, machinery, or other fixture for which he is not under this Act or otherwise entitled to compensation, and which is not so affixed in pursuance of some obligation in that behalf or instead of some fixture belonging to the landlord, then such fixture shall be the property of and be removable by the tenant:

Provided as follows:

1. Before the removal of any fixture the tenant shall pay all rent owing by him, and shall perform or satisfy all other his obligations to the landlord in respect of the holding:
2. In the removal of any fixture the tenant shall not do any avoidable damage to any building or other part of the holding:
3. Immediately after the removal of any fixture the tenant shall make good all damage occasioned to any building or other part of the holding by the removal:
4. The tenant shall not remove any fixture without giving one month's previous notice in writing to the landlord of the intention of the tenant to remove it:

4. At any time before the expiration of the notice of removal, the landlord, by notice in writing given by him to the tenant, may elect to purchase any fixture comprised in the notice of removal, and any fixture thus elected to be purchased shall be left by the tenant, and shall become the property of the landlord, who shall pay the tenant the fair value thereof to an incoming tenant of the holding; and any difference as to the value shall be settled by a reference under this Act, as in case of compensation (but without appeal):

But nothing in this section shall apply to a steam-engine erected by the tenant if, before erecting it, the tenant has not given to the landlord notice in writing of his intention to do so, or if the landlord, by notice in writing given to the tenant, has objected to the erection thereof.

GENERAL APPLICATION OF ACT.

No Restriction on Contract.

54. Nothing in this Act shall prevent a landlord and tenant, or intending landlord or tenant, from entering into and carrying into effect any such agreement as they think fit, or shall interfere with the operation thereof.

Adoption of Parts of Act by Agreement.

55. A landlord and tenant, whether the landlord is absolute owner of the holding for his own benefit or not, may, in any agreement in writing relating to the holding, adopt by reference any of the provisions of this Act respecting

procedure or any other matter, without adopting all the provisions of this Act; and any provision so adopted shall have effect in connection with the agreement accordingly.

But where, at the time of the making of the agreement, the landlord is not absolute owner of the holding for his own benefit, no charge shall be made on the holding, under this Act, by virtue of the agreement, greater than or different in nature or duration from the charge which might have been made thereon, under this Act, in the absence of the agreement.

Application of Act to Future Tenancies.

56. This Act shall apply to every contract of tenancy beginning after the commencement of this Act, unless, in any case, the landlord and tenant agree in writing, in the contract of tenancy, or otherwise, that this Act, or any part or provision of this Act, shall not apply to the contract; and, in that case, this Act, or the part or provision thereof to which that agreement refers (as the case may be), shall not apply to the contract.

Application of Act to Existing Tenancies.

57. In any case of a contract of tenancy from year to year or at will, current at the commencement of this Act, this Act shall not apply to the contract, if within two months after the commencement of this Act the landlord or the tenant gives notice in writing to the other to the effect that he (the person giving the notice) desires that the existing contract of tenancy between them shall remain unaffected by this Act; but such a notice shall be revocable by writing; and in the absence of any such notice, or on revocation of every such notice, this Act shall apply to the contract.

In every other case of a contract of tenancy current at the commencement of this Act, this Act shall not apply to the contract.

Exception of Non-Agricultural and Small Holdings.

58. Nothing in this Act shall apply to a holding that is not either wholly agricultural or wholly pastoral, or in part agricultural and as to the residue pastoral, or that is of less extent than two acres.

Exception where other Compensation.

59. A tenant shall not be entitled to claim compensation under this Act and under any custom of the country or contract in respect of the same work or thing.

General Saving of Rights.

60. Except as in this Act expressed, nothing in this Act shall take away, abridge, or prejudicially affect any power, right, or remedy of a landlord, tenant, or other person, vested in or exercisable by him by virtue of any other Act or law, or under any custom of the country, or otherwise, in respect of a contract of tenancy or other contract, or of any improvement, waste, emblements, tillages, away-going crops, fixtures, tax, rate, tithe-rentcharge, rent, or other thing.

IV.—*Note on the Interpretation of Clause* 6 *of the Agricultural Holdings* (*England*) *Act*, 1875. By Sir T. DYKE ACLAND, Bart., M.P.

THERE is a question as to the meaning of a very important clause in the Agricultural Holdings Act, on which I believe that a serious mistake has been made and widely circulated.

It has been assumed that compensation for every improvement in the first class is to be deemed to continue unexhausted for twenty years, and for every improvement in the second class for seven years.

As my attention was specially called to this subject, and as I had the assistance of a very able draftsman in framing and considering amendments during the passage of the Bill through the House of Commons, I may perhaps be allowed to state what I believe to be the effect of the Act, as it certainly was understood at the time to be the intention of the Government.

To show that the matter is of no slight importance one or two practical illustrations may suffice.

One tenant may apply bones or lime to pasture, which he does not mow; another may apply the same kind and amount of manure, and take two or three crops of hay; or to arable land, and take two crops of corn.

If these two tenants leave their respective farms in the third or fourth year, are the referees bound to award the same compensation to both alike?

Or to take a case under the first class. I have made many acres of water-meadow, at a cost of 10*s.* or 15*s.* per acre. In some places water-meadows cost 10*l.* or 15*l.* per acre. Is the claim for compensation on account of "making of water-meadows or works of irrigation" to run as a matter of course for twenty years, and to be put on the same footing as the erection of a stable or a cattle-shed?

It appears to have been taken for granted that the Act states *positively* that improvements shall be deemed to be unexhausted for twenty or for seven years: whereas it only fixes *negatively* a maximum limit, beyond which improvements shall not be deemed to be unexhausted.

The 6th Clause of the Act runs thus: "An improvement shall *not in any case* be deemed, for the purposes of this Act, to continue unexhausted *beyond* the respective terms following after the year of tenancy in which the outlay thereon is made:

When the improvement is of the 1st class, the end of 20 years
,, ,, 2nd ,, ,, 7 ,,
,, ,, 3rd ,, ,, 2 ,, "

I understand this to mean, that the time for which an improvement is deemed *for the purposes of the Act* to continue unexhausted, is a question of *fact* which (unless settled previously by contract) is to be determined in the case of each improvement *by the referees*, subject only to the maximum limit imposed by the sixth section. (I am not speaking here of the limited owner.)

The 31st Clause of the Act imposes on the referees the duty of finding and stating the time at which each improvement in respect whereof compensation is awarded is taken to be exhausted.

To apply this to the case under the second class suggested above. Suppose the two tenants to have each laid out 70*l.* in bones or lime in the year ending Lady Day, 1876. Suppose their tenancy to determine at Lady Day, 1880. In one case the referees may consider that the tenant has been repaid in four years; in the other case they may consider the tenant entitled to the full compensation allowed by the Act. If the referees are to act on their own judgment, one tenant would receive 70*l.*, less $\frac{4}{7}$ths of 70*l.*, or 30*l.*; the other would receive nothing. Does the Act require them to award the same amount to both?

I have endeavoured to put the point at issue clearly before the readers of the Journal. They will be able to form their own judgment, or to consult their professional advisers. It would be presumptuous in an unlearned person to argue a point of law, nor would the Journal be the place for the argument. I could, I believe, support what I have stated by a reference to what took place while the Bill was in committee—to the nature of the objections urged and the assurances and explanations by which they were answered. But after all, the Act as it passed is the law of the land, and will be interpreted by the proper tribunals. Meanwhile it is important that the Act should not be needlessly misunderstood. It is also very desirable, if the ostensible purpose of the Act is not to be defeated, that undue expectations should not be raised, nor groundless alarms entertained.

Let it be borne in mind what were repeatedly stated to be the objects of the Act, namely, to promote good written contracts, and to define the limits within which these contracts might be so made as to be binding on successors.

I have purposely omitted all reference to the letting value in the case of the limited owner, as that subject would only introduce a needless element of complication.

Nor have I touched on the question, whether an absolute owner who is willing to grant compensation beyond the number of years fixed by the Act, or for improvements not named in the Act, can avail himself of its machinery for either of these purposes.

The whole question of incorporating existing agreements with the Act is one which requires careful consideration.

The same may be said of framing new agreements in accordance with the Act, defining what is vague, and adapting the Act to the circumstances of different districts.

V.—*Farm Agreements in reference to the Agricultural Holdings Act.* By C. RANDELL, of Chadbury, Evesham.

THE Agricultural Holdings (England) Act, 1875, has changed altogether the presumption of law in reference to unexhausted improvements. Whereas formerly, if a tenant held his farm without any agreement, and where no custom was established under which he had a claim on quitting for such improvements, they became the property of his successor, now he has a legal claim to compensation for them. The effect of this legislation will be, that such compensation will become universal. Where it is already secured by custom or agreement the Act will make no change, but where farms have been held "at will," as the practice is called, or under agreements which do not provide such compensation, either the Act will apply, or agreements framed in the spirit of the Act will be entered into.

It may be useful to those landlords and tenants, who contemplate the adoption of the latter course, to consider the terms of a form of agreement adopted upon the estate of the late Mr. Holland, in 1863, with a view to getting rid of a practice very common at that time—and still existing—viz., that tenants, when about to quit their farms, whether held on lease or at will, took all they could out of the land because their predecessors had done so, and because they would not be compensated for doing otherwise. The objects sought to be attained by the agreement were—

First. To induce the outgoing tenant to continue to farm well to the end of his tenancy, by paying him for the unexhausted value of his improvements.

Secondly. To allow him to dispose of his produce as he pleased, bringing upon the farm an equivalent in purchased food and manures.

Thirdly. To avoid all restrictions as to cropping, but providing that the farm should be left in such a state as would involve no loss to the next tenant.

The clauses of the agreement intended to effect these objects are worded thus:

All hay, straw, potatoes, roots, cabbages, and other food for cattle, grown upon the said farm, shall be consumed thereon; or if sold, one-half of the proceeds of such sales shall, within six months after any such sales, be expended in manure approved by the landlord or his agent, to be applied either to green crops or to the pasture land, the other half in oilcake or linseed to be given to cattle or sheep. All manures, whether made from the produce of the farm, or purchased in exchange for such produce sold, shall be used upon the said farm, or in the last year of the tenancy left for the benefit of the succeeding tenant. Notice shall be given by the said tenant to the said landlord or his agent previous to any such sale of hay, straw, or other produce, and vouchers shall be produced for the manure or oilcake bought instead thereof. If any hay or straw be destroyed or damaged by fire, the value thereof shall be expended in the purchase of other hay and straw, or in manures and oilcake, in the same manner as if such hay and straw had been sold.

The meadow and pasture land shall be manured after every alternate mowing, with not less than ten loads per acre of rotten dung, or fifteen of long manure or good compost, or an equivalent in ground bones or other manure approved by the said landlord or his agent. The land shall be kept during the tenancy under this agreement in a clean and good state and condition, and so cropped that, at the expiration thereof, the arable land shall be in the following condition, or the said tenant shall pay to, or be paid by, the said landlord for any deviation therefrom, such sum as the arbitrators appointed, as hereinafter mentioned, shall determine.

1. One-half of the arable land shall, on such expiration of tenancy, be clean and in good condition, and fit to plant with white straw crops; of such half-part, one moiety shall have been fallowed (with or without green crops) during the previous summer, the other moiety thereof shall have been wholly under clover or mixed grass-seeds, or part in clover and the rest beans or peas, after being manured—none of the clover or other grasses having been allowed to stand for seed.

2. One-fourth of the arable land shall have been sown in the spring of the year preceding the termination of the tenancy, with clover or other proper mixed grass-seeds, upon land fallowed the previous year and clean; the seeds, sowing, and harrowing to be paid for by the said landlord or his incoming tenant, provided they have not been grazed after harvest.

3. Not more than one-fourth of the arable land shall require to be fallowed in the year after the termination of the tenancy, nor require an outlay of more than fifty shillings per acre to clean it; if it require less than that sum, the said landlord or his incoming tenant shall pay the difference, if more than that sum the said tenant shall pay it.

4. And it is hereby agreed that, not later than one month before the termination of the tenancy under this agreement, the said tenant and the said landlord, or his incoming tenant, shall each appoint an arbitrator; these arbitrators shall meet not later than ten days before the expiration of the tenancy, and having appointed an umpire, shall proceed to consider the claims made by either party; in case either party refuse or neglect to appoint an arbitrator, the other may nominate an umpire, who shall have the same powers as if he had been appointed by the arbitrators jointly; and any award made in pursuance of this agreement shall be final and binding upon both parties, and may be made a rule of any superior Court of Law; the terms "clean and in good condition," and the construction of all covenants and stipulations herein used shall be understood in a reasonable and practical sense, and the claims contingent thereupon treated accordingly.

5. The arbitrators shall first consider how far the state of the farm differs, if at all, from that herein stipulated, and they shall decide whether the said tenant or the said landlord, or his incoming tenant, is entitled to any and what

compensation on account of such variation; they shall then settle the other claims between the parties upon the following basis:

6. The said landlord, or his incoming tenant, shall pay after the rate of fifty shillings per acre for all land in excess of one-half which, under the above conditions, is fit to be planted with white straw crops, or shall be paid by the said tenant at the same rate for all short of one-half of the arable land so fit.

7. Not less than one-fourth of the clover or mixed grass-seeds shall be mown for hay during the last year, for the use of, and to be paid for by, the incoming tenant; for the remainder of the land whereon clover or other grasses have been grazed the whole summer by sheep, the incoming tenant shall pay after the rate of forty shillings per acre, provided such land be clean, and that only one crop of corn has been taken since the previous fallow.

8. The said tenant shall be entitled to the sum of fifty shillings per acre for all clean fallows, whether after vetches eaten while green, or bare fallows; if not clean and ready to plant with corn, the cost of making them so must be deducted. For all root-crops he shall be paid the value, not the cost of cultivation—provided the land be clean,—if it be not so, the cost of cleaning it must be deducted.

9. If the said tenant has not sold hay, straw, or roots, and has purchased manure within the last two years of the tenancy, or if he has purchased manures in excess of the quantity required to replace the hay and other produce so sold, he shall be paid one-half the cost of all such purchased manures in excess of the quantity so required which shall have been applied to green crops or grass land in the last year of the tenancy, and one-fourth of the cost of that in the last year but one, such cost not having exceeded forty shillings per acre. All unprepared bones and lime used upon any part of the farm during the last four years of the tenancy shall be paid for, deducting one-fourth for every year's use; and on pasture land during the last six years, deducting one-sixth for every year's use—provided such pasture land has not been mown in that time; and for every other fertilizer of a permanent nature, such allowance as the arbitrators may determine, and also one-half of the cost of all oilcake or linseed consumed during the last year, and one-fourth of that in the last year but one—provided that such oilcake or linseed has been given to cattle and sheep, and does not exceed the average of the three years preceding the last year of the tenancy.

10. The said tenant shall be paid such sum as the arbitrators may determine for all permanent improvements made with the sanction, in writing, of the said landlord or his agent.

These outgoing covenants, numbered now for reference, apply to Michaelmas tenancies, and to districts where it is not customary to leave the seeds down more than one year. For the Cotswold Hills, the following are substituted for Nos. 1, 2, and 3:

One-fifth of the arable land shall, on such expiration of tenancy, be clean and in good condition, and either planted or fit to plant with wheat after second year's seeds grazed during the previous summer.

One-fifth of the arable land shall have been cleaned and planted with roots (turnips, swedes, or mangolds) in the summer preceding the termination of the tenancy; these crops to be taken by the incoming tenant. If the land be not clean, the cost of making it so shall be deducted from the amount of the valuation of the root-crop.

One-fifth of the arable land shall have been sown, in the spring of the year preceding the termination of the tenancy, with clover or other proper mixed grass-seeds, upon land fallowed the previous year and clean; the seeds, sowing, and harrowing to be paid for by the incoming tenant—provided they have not been grazed after harvest.

One-fifth of the arable land shall be in one-year-old seeds or sainfoin, and not more than one-fifth of the arable land shall require to be fallowed in the year after the termination of the tenancy, nor require an outlay of more than forty shillings per acre to clean it; if it require less than that sum the said landlord, or his incoming tenant, shall pay the difference; if more than that sum the said tenant shall pay it.

No. 7 is omitted, and the following is instead of No. 8:

The said landlord, or his incoming tenant, shall pay after the rate of forty shillings per acre for all land in excess of two-fifths which, under the above conditions, is fit to be planted with white straw crops, namely, after two-year-old seeds and root crops; or shall be paid by the said tenant at the same rate for all short of two-fifths of the arable land so fit.

Upon an estate in Staffordshire, with Ladyday entries, the following take the place of Nos. 6, 7, and 8:

The said tenant having planted not more than one-fourth part of the arable land with wheat, in the autumn preceding the termination of the tenancy, shall be paid two-thirds of the value of that portion sown upon fallow, well-manured, and with or without green crops—provided those crops have been consumed where grown, by sheep; and one-half of the value of that portion which shall have been sown after clover, beans, or peas; the value of such wheat crop to be settled in the month of July, not including the straw, and deducting the cost of cleaning and harvesting the said tenant's share of such wheat crop.

Not less than one-sixth of the wheat-straw grown in the preceding year shall be left at the termination of the tenancy, and shall be paid for by the said landlord, or his incoming tenant, at a consuming price, together with any other straw, hay, clover, or roots then remaining.

The said tenant shall not, during the six months preceding the termination of the tenancy, give any hay or straw to cattle, except in the yards and buildings; nor graze the land described as meadow later than the 2nd of February, but shall effectually cleanse the gutters and carriers of such meadows, and properly irrigate them during the autumn, winter, and spring—being paid for the labour of so doing; or the said landlord, or his incoming tenant shall be at liberty to do so instead, giving notice to the said tenant that such is his intention.

The said tenant shall properly plough all stubbles not sown with seeds, and cart the manure where required by the said landlord, or his incoming tenant, during the autumn and winter preceding the termination of the tenancy—being allowed compensation for so doing; and, after the 2nd day of February, shall allow the landlord, or his incoming tenant, to plough and cultivate any of the land not sown with wheat, except such part not exceeding one-third of the last year's turnip crop then unconsumed, which shall be given up to the said landlord, or his incoming tenant, as fast as cleared, so that no part of the land or buildings shall be retained by the said tenant after the termination of the tenancy, viz., 25th March.

With this addition to No. 9:

In each case making a deduction for such portion of the purchased manure or food as the tenant is to be paid for in the value of his off-going wheat crop.

It is obvious that detailed provisions of this nature could not be embodied in an Act of Parliament; and it seems, therefore, desirable that, fully recognising the intention of the Act, there should be agreements of tenancy defining how the tenant is to be paid for the unexhausted value of his purchased manures and food; how he is to return to the land during his tenancy an equivalent for the produce sold; and in what state he should give up the farm when his tenancy expires. These agreements have been adopted upon estates in Gloucestershire, Worcestershire, Warwickshire, and Staffordshire. They have been tested by conflicting arbitrators, where tenants entitled to compensation have left their farms, and in cases where claims for breach of the covenants, providing how the farm should be given up, had to be set against the valuation of hay, straw, roots, &c. —and no reason for any change has resulted.

It will be seen that these agreements, which are in substance the same as when framed twelve years since, are entirely in accordance with the spirit of the Act of Parliament passed last year, and give what that Act could not attempt—freedom as to cropping, and disposal of produce; that in their details they give a larger amount of compensation for unexhausted manures and food than is provided for by the Act, under which a tenant has no claim for improvements of this—the third class—after taking a crop of corn; whereas the agreements, of which these covenants form part, by stipulating for the payment of one-fourth of the cost of manure applied to green-crops, and of oilcake purchased in the last year but one, recognise the undoubted fact that where such manures have been applied to the growth of turnips, and these have been consumed upon the land by sheep, eating oilcake, the benefit to the land is not exhausted by one crop of corn, but extends to the following clover and wheat. And as the Act of Parliament protects the landlord from waste, only by giving him a remedy by counter-claim where an off-going tenant claims compensation for some improvement, and none where no such improvement has been made, it is clear that the landlord's remedy under the agreements, against a tenant who leaves his farm in a condition involving loss to his successor,—viz., setting-off the penalty for default against the amount to which the off-going tenant is entitled for hay, straw, roots, and acts of husbandry,—is a more simple and effectual one than that provided by the Act.

VI.—*On the Theoretical and Practical Value of Purchased Food, and of its Residue as Manure.* By Dr. AUGUSTUS VOELCKER, F.R.S.

IN the capacity of Consulting Chemist to the Royal Agricultural Society I frequently receive for analysis samples of oilcakes, cereal-grains, and other kinds of food for stock, and am requested not only to determine their nutritive value but also to express an opinion with regard to their money-value.

The questions put to me may appear simple enough and not difficult to answer; and yet I am bound freely to confess that no inquiries are, in my judgment, more difficult to answer satisfactorily than those with respect to the comparative money-value of various articles of food.

There is no difficulty in determining by analysis with tolerable precision the fertilising and commercial value of guano, sulphate of ammonia, nitrate of soda, superphosphate of lime, and other portable manures, because the commercial value of artificial manures depends mainly upon their composition. The amount of ammonia, nitric acid, soluble and insoluble phosphate of lime, or potash, in a manure, can be ascertained with certainty by analysis. The various constituents upon which the fertilising properties of the various kinds of artificial manures mainly depend may either be bought separately—some in the form of simple saline compounds, others in commercial products, which, like dried blood or wool-refuse, owe their fertilising properties to the nitrogen they contain—or they may be purchased in articles of commerce, which, like bone-dust, contain more than one manuring element. In either case, we have to do with commercial products, the money-value of which is regulated by the kind and amount of the real fertilising constituents contained in them; and although the market-price of ammonia or of phosphate of lime, &c., is subject to fluctuations, the money-value of compound artificial manures can, nevertheless, be ascertained by analysis with sufficient precision to guard the purchaser against frauds on the part of the dealer.

But a far more difficult case is submitted to the agricultural chemist when he is requested to analyse an article of food and to give an opinion of its nutritive and money-value. By appropriate analytical processes the proportions of starch, albumen, gluten, oil, woody-fibre, and other constituents which enter into the composition of feeding-stuffs, may be determined readily enough; but as these constituents are not sold separately in a form in which they may be used economically by the feeder of stock, it is not possible to assign a separate money-value to them.

Most kinds of cattle-food, such as cereal grains, oilcakes, and roots, are compounds containing variable proportions of starch, sugar, oil, albuminous substances, woody-fibre, and mineral matters. Their market-value does not simply depend upon the proportions of their food-constituents, but also, and to a very large extent, upon the economical use which can be made of various kinds of food in common life, or in farm-practice; and as we do not know exactly to what extent the starch, or the sugar, or the albuminous substances in foods, severally contribute to produce the total practical effect which follows from their use, it seems to me that the requisite data are wanting from which the money-value of various articles of food can be calculated with anything approaching precision.

Attempts have repeatedly been made by agricultural writers to place a certain money-value upon the starch, sugar, albuminous substances, and other food-constituents; but as all such attempts have brought to light inconsistencies and discrepancies between the calculated and actual price at which various articles of cattle-food are sold in the market, I need not dwell further upon the practical mistakes of those who have proposed certain scales or rates for a given weight of starch, oil, sugar, albumen, &c., in estimating the money-value of purchased foods. In the earlier periods of the history of the trade in artificial manures, valuation scales were used with much benefit in checking unscrupulous dealings; and even at the present time such scales materially assist the agricultural chemist who is neither a mere calculating machine nor a purely theoretical man, and who makes a discriminate use of them to give a trustworthy opinion of the proximate and the comparative money-value of artificial manures which may be submitted to him for analysis. In a paper "On the Commercial Value of Artificial Manures," published in this Journal in 1862, I directed attention to a number of practical considerations which have to be taken into account in estimating the commercial value of artificial manures, and showed that serious mistakes will be made, and possibly undeserved injury to honest traders may be done, if such estimates are entirely based upon the figures given in valuation tables.

Difficulties, no doubt, occur sometimes when the agricultural and commercial value of some kinds of artificial manure is sought to be determined with great precision; but far greater and more numerous are the obstacles which present themselves in attempts to put a money-value upon articles of food; and it may be as well to state, in plain language, that the money-value of cattle-foods cannot be determined simply by analysis.

Nevertheless, the chemical examination of feeding-stuffs must not be regarded as void of all practical interest, for it enables us to get, at least, some insight into their characters, and affords useful hints to the stock-feeder in the selection of the most suitable food which he may require for fattening stock, as well as for working-horses or milch-cows.

In oilcakes, corn, hay, roots, and most articles of food, we find the following groups of food-constituents:—

1. Nitrogenous, or albuminous compounds, as flesh-forming matters.
2. Non-nitrogenous, or fat and heat-producing compounds.
3. Mineral matters, or ash-constituents.

1. The first class includes:

Vegetable Albumen, a substance identical in composition and chemical properties with the white of eggs.

Gluten, or vegetable fibrine, a compound occurring in considerable proportions in wheat, and in smaller proportions in other cereal grains; it closely resembles the fibrine of blood and the substance of lean flesh and muscle.

Vegetable Casein, or legumin, a substance identical in composition with the casein of milk. Like milk-casein, legumin is curdled or precipitated from its solution in water on the addition of dilute acids, but is not coagulated like albumen on boiling. It occurs in large quantities in peas, beans, lentils, and other leguminous seeds.

The nitrogenous compounds constitute a remarkable class of organic substances. They all contain about 16 per cent. of nitrogen, and small quantities of sulphur or phosphorus, or both, in organic combination.

Vegetable albumen, identical in composition and properties with animal albumen, may be regarded as the type of this important group of compounds, which frequently figure in scientific works or in food-analyses under the generic name of albuminoids, or albuminous compounds. They are also called flesh-forming matters, because they not only closely resemble muscular fibre in composition and general properties, but are absolutely necessary for the formation of the substance of lean flesh.

Peas, beans, and all leguminous seeds, linseed-, rape-, cotton-, and other oilcakes, are rich in flesh-forming matters or albuminoids; and most cereal grains also contain considerable proportions of such compounds; whilst roots, green produce, straw, chaff, and similar bulky feeding-materials, are, comparatively speaking, poor in albuminoids.

No food entirely destitute of albuminous compounds is capable of supporting life for any length of time, for direct experiments have proved, beyond dispute, the fact that the animal organism does not possess the power inherent in plants of transforming saline, or other, compounds containing nitrogen, into flesh-forming matters. Thus it has been shown that animals fed exclusively upon starch, sugar, fat, and other food entirely destitute of albuminous compounds, rapidly lose flesh, and die at the end of the fifth or sixth week, or but little later than they would have died if no food at all had been given.

Recent experiments, moreover, have established the fact that albuminoids, like starch and other non-nitrogenous compounds, are capable of becoming oxidised in the animal system and furnishing animal heat; and it has likewise been shown that the albuminous compounds of food, in addition to their power of forming muscle, have the property of becoming split up into fat and urea during the process of digestion. Indeed, some physiologists maintain that the fat of animals is mainly, if not entirely, derived from this source, and not from starch or sugar, or analogous non-nitrogenous constituents of food. Recent physiological experiments with reference to the formation of fat from albuminoids, however, are not quite decisive; and they certainly do not invalidate the well-established experience that a large proportion, at all events, of the fat of animals is derived either from ready-made fatty substances, or from starch and other readily assimilable non-nitrogenous compounds in food such as is given to fattening oxen, sheep, and pigs.

Whichever view may be entertained with regard to the fat-producing power of albuminoids, they are certainly a most important class of compounds; and it may be laid down as a fact, established alike by practice and science, that the nutritive value of food depends in a great measure upon a certain amount of albuminous compounds, which may be more or less, according to the description of the animal, or the purpose for which it is kept on the farm.

2. The non-nitrogenous, or fat- and heat-producing substances, may be conveniently divided into three groups:—

a. Ready-made fat.
b. Carbon-hydrates.
c. Woody-fibre, or cellulose.

Ready-made fats and oil are by far the most valuable of all food-constituents in an economical point of view, for oil or fatty matters fetch a higher price than any nitrogenous compounds, or than starch, sugar, or any other non-nitrogenous substance. Oil and ready-made fatty matters are particularly well adapted to the laying on of fat in animals, inasmuch as the composition of vegetable fats is analogous to that of the several kinds of fat which form part of the bodies of animals. The fatty matters of food, without undergoing much change, are therefore readily assimilated by the animal organism, and, when given in excess, are stored up as animal fat.

The proportion of carbon in fat amounts to about 80 per cent., and is much larger than in starch or sugar. In round numbers, one part by weight of fat or oil is as valuable a feeding-material as two-and-a-half parts of sugar or starch. Besides this, fat serves important functions in the processes of digestion and nutrition. It has been shown by actual experiments, that albuminous substances deprived of fat remain longer in the stomach, and require more time for their conversion into cells and muscular fibre, than when associated with fatty matters. There is good reason for believing that fat is largely concerned in the formation of bile, and that the digestive power of the pancreatic fluid is due, in great measure, to its presence.

Fat certainly possesses high digestive powers, and appears to assist the solution of food, and its absorption into the blood. Colourless blood-corpuscles receive, perhaps, the first impulse of their formation from the metamorphosis of fat, and thus it may be an important aid in the formation of blood.

Fat thus takes an active part in the processes by which the nutritive constituents of food are converted into butcher's meat. Not only is it concerned in the formation of new tissue, but it also pervades, and finally disintegrates, the older structures, especially when their vitality is low. In this manner it helps in the solution of effete nitrogenous products, and their subsequent removal from the animal body.

Starch, gum, mucilage, and sugar are appropriately called carbon-hydrates, for in them carbon is combined with the same relative proportions of oxygen and hydrogen in which the two latter elements form water. In starch, sugar, and analogous carbon-hydrates, the hydrogen is therefore fully oxidised, and the carbon only is capable of oxidation, and of generating animal heat by its oxidation or combustion. As already stated, the heat-producing power of fat or oil is about twice and a half as great as that of starch or sugar.

The carbon-hydrates of food not merely generate animal heat, which is, in reality, the final result of their oxidation, but they likewise give rise to lactic and other organic acids, which perform important functions in the digestion of food. The presence of lactic acid in the stomach appears to be essential to the digestion of the albuminous compounds of food, and its occurrence in the juice of flesh probably assists the solution of effete tissues.

When food rich in starch or sugar is given to animals in larger quantities than is required to support respiration, and to generate animal heat, the excess of the carbon-hydrates supplied in the food is converted into fat, which is stored up in the body. It was denied at one time that animals possess the power of eliminating from starchy compounds and analogous substances the elements which are subsequently reconstructed into fat; but Boussingault's, Liebig's, and Lawes and Gilbert's experiments have clearly proved that fat may be, and always is, derived from the carbon-hydrates of the food of fattening-stock; and common experience fully confirms the results of these experiments, for it is well known that the meal of cereal grains, and of other food rich in sugar, is highly esteemed as good fattening material.

Cellulose, or woody fibre, according to its condition of digestibility, depending upon the more or less matured state of the vegetable containing it, displays similar, or the same, functions in the animal economy as starch and sugar. The tender cellular fibre of unripe straw, or of hay, is certainly assimilated to a very large extent by herbivorous animals, whilst the hard woody fibre of over-ripe grass or straw is digested less perfectly, and rejected in larger proportions in the dung.

Oxen appear to be capable of digesting cellulose, and deriving nourishment from it in a larger measure than sheep; but it appears doubtful whether pigs are able to digest cellulose or woody fibre at all. Thus a bulky food, containing much straw-chaff, may be given with more advantage to cattle than to sheep.

3. The *saline* or *mineral* constituents of food are largely concerned in the metamorphosis of matter, for it is a special function of these substances to give a soluble form to the plastic constituents of food and of the animal tissues. They are, in fact, the chief, if not the only, media for the transference of organic matter from place to place in the animal body, being, on the one hand, the conveyers of nutritive materials into the system, and, on the other, the carriers of effete substances out of it.

The saline or mineral constituents of food thus play an important part in the phenomena of digestion, assimilation, and secretion, being required for the formation of blood, the juice of flesh, and other animal secretions.

A considerable proportion of the mineral constituents of food consists of earthy phosphates: they not only supply to the animal body the materials of which the greater part of bones consists, but they also enter into the composition of flesh.

Nearly the whole of the mineral matters of food pass into the liquid and solid excrements, only a small proportion being retained in the system, except in the case of young growing animals, which, requiring much phosphate of lime for the growth of bone, extract the earthy phosphates from food to a greater extent than full-grown fattening stock.

The soluble portion of the mineral food-constituents, consisting principally of common salt and potash-salts, is constantly rejected in the urine; whilst the insoluble portion, consisting chiefly of phosphate of lime and magnesia, carbonate of lime and silica, passes away in the solid excrements.

It is hardly necessary to state that no animal can live, for any length of time, exclusively upon starch or sugar, or upon albumen. The requirements of the animal body necessitate a mixed food containing all the constituents, to the functions of which brief reference has been made. With the exception of treacle, which is occasionally used for feeding purposes, there is no feeding-stuff which consists entirely or mainly of one group of alimentary matters.

All feeding materials, whether they are cereal grains, leguminous seeds, roots, grass, or chaff, are mixed foods, containing variable proportions of nitrogenous and non-nitrogenous organic matters, and of saline and phosphatic earthy compounds. In its natural state the animal eats no more than the necessary amount of food to provide, firstly, carbon for the support of respiration and for keeping up the animal heat, and, secondly, enough nitrogenous and mineral constituents to keep in healthy action the complicated processes of digestion, assimilation, and secretion.

A full-grown animal, in a state of perfect health, neither increases nor decreases in weight when it is allowed to help itself with as much grass, or whatever else may be its natural food, as it pleases, uncontrolled by human agency. The larger portion of the non-nitrogenous constituents of the food is oxidised, and passes off as carbonic acid from the lungs, whilst the mineral matters contained in the food are ejected from the system almost entirely, either in the urine or in the solid excrements.

The nitrogenous constituents of food are decomposed more or less completely before they are ejected by the animal. As the result of this decomposition, two new classes of substances are produced. One class comprehends compounds containing all, or nearly all, the nitrogen of the decomposed albuminoids, united with comparatively little hydrogen, carbon, and oxygen; the second class contains the remaining quantity of carbon, hydrogen, and oxygen. Urea, uric, and hippuric acids are the principal highly nitrogenised organic products; lactic acid, fatty matters, and some other combinations of a less definite chemical character, are the products destitute of nitrogen which result from the decomposition of the albuminoids of food.

Whilst thus the greater part of the non-nitrogenous constituents of food is wasted in the exhalations from the lungs, nearly the whole of the mineral and nitrogenous constituents of food pass into the solid and liquid excrements of animals. As a rule, food rich in nitrogen is also rich in phosphate of lime and other animal matters; and hence the excrements of cattle fed upon such food are both richer in phosphates and in nitrogen, and possess a greater fertilising value, than the excreta voided by cattle fed upon less nitrogenous and more carbonaceous food.

MONEY-VALUE OF THE CONSTITUENTS OF ARTIFICIAL FOOD.

Having considered the functions of the several constituents of food in the animal economy, I will offer a few remarks on their comparative practical or money-value.

Oil and Fatty Matters.—As indicated already, oil and fatty matters are by far the most valuable and expensive ingredients of feeding-stuffs. In round numbers, one part, by weight, of fat or oil is worth as much for feeding purposes as 2½ parts of starch or sugar. In examining various articles of food for the purpose of obtaining an insight into their nutritive value, it is necessary, therefore, to determine accurately the amount of oil or fatty matter which they contain. The fattening value of some kinds of cattle-food in a great measure depends upon the amount of ready-made fat which they contain. For instance, the feeding and commercial value of palm-nut meal or cake, rises or falls with the percentage of fatty matter which the oil-crusher leaves in the meal or cake. Some crushers extract the fat from palm-nut kernels much more perfectly than others; and as the commercial value of this kind of food is regulated in a large measure by the percentage of fatty matters, palm-nut meal is sold at from 5*l.* 5*s.* to 8*l.* 8*s.* per ton, the difference in the price being caused solely by the smaller or larger proportion of fatty matter which has been left in the expressed palm-nut kernels. The cheaper kinds of palm-nut meal, selling at from 5*l.* 5*s.* to 6*l.* 10*s.* per ton, usually contain from 3 to 6 per cent. of fatty matter, whilst the more expensive and more valuable palm-nut meals contain from 15 to 18 per cent. of fat, and no more, or rather less, albuminous compounds than the cheaper kinds. Assuming ready-made fat to be worth 3*d.* per lb. for fattening purposes—and this perhaps is too low an estimate, considering that 1 lb. of fat is worth as much as 2½ lbs. of starch or sugar, and that the latter cannot be bought in the cheapest kinds of food at a cheaper rate than 1¼*d.* to 1½*d.* per lb.—the difference in the fattening and commercial value of the poorest samples of palm-nut meal, containing only 3 per cent. of ready-made fat, and the richest yielding 18 per cent., amounts to about 4*l.* per ton, or 1*l.* more per ton than the difference in the actual selling price of the cheapest and most expensive samples. It therefore follows that the higher priced palm-nut meals at 8*l.* per ton are comparatively cheaper, in reality, than those which contain only 3 per cent. of fat, and are sold at about 5*l.* per ton.

A practical proof of the commercial value of oil or fat is presented to us in dried brewers' grains and rice-meal. Notwithstanding the large amount of husks in both these feeding-stuffs, they find a ready sale at about 7*l.* per ton; and as they contain only a moderate amount of albuminous compounds, but from 5 to 8 per cent. of ready-made oil and fatty matter, and have been found in practice to be well worth the money for which they are sold, there can be little doubt that it is the comparatively large amount of oil and fat contained in them which enhances their feeding value.

Starch, Gum, and Sugar.—In the next place we have to consider the practical value of starch, gum, and sugar for feeding purposes. Next to oil and fatty matter, these are probably the most valuable constituents of food. Starch is readily transformed into gum and sugar; and direct feeding experiments have shown that starch and sugar, and analogous carbon-hydrates, weight for weight, have practically the same value as constituents of food.

In the shape of treacle, sugar is used occasionally for rendering straw-chaff, or insipid badly made hay, more palatable. A solution of treacle in hot water, poured over straw-chaff, no doubt gives a greater relish to cattle for such bulky and innutritious food; but the question may well be raised whether the practical benefit of this treatment of straw-chaff is commensurate with the expense. Treacle, or molasses of a quality usually sold as cattle-food, and costing about 9*l.* per ton, contains on an average from 54 to 60 per cent. of sugar, the rest being water and saline and other impurities. A ton of sugar in the form of molasses thus costs from 15*l.* to 16*l.* 12*s.*, on an average; and this is about one-half more than the price at which wheat, beans, oats, or barley-meal can be bought. It is evident, therefore, that the price of treacle is far too high to permit its being employed economically for feeding or fattening purposes. It may be said that although treacle is dear in comparison with the market-price of other feeding-stuffs, it nevertheless is a very useful substance to stock-feeders, who have plenty of straw to spare, and who require a sweetening substance to induce cattle to consume a larger quantity of straw-chaff than they would eat if it were not made more palatable; and that for that purpose not a very large quantity of treacle will meet the requirements of the case. This may be so; but a farmer, who has at his command a good supply of well-matured mangolds or swedes, surely may attain the same object if he mixes straw-chaff with pulped roots, and allows the mixture to heat to some extent, by keeping it for twelve hours before giving it to his cattle. In well-ripened mangolds, swedes, or carrots, as is well known, a large proportion of the solid feeding-matter consists of sugar; and unquestionably it is in the shape of root-crops that sugar is employed for feeding and fattening purposes in the most economical manner.

If root-crops have been more or less of a failure, or if a sufficient breadth of land cannot be put into roots, and the root-supply is in consequence too scanty to meet the requirements of the stock-feeder, especially if he wishes to consume much straw-chaff, I would recommend him to buy locust-beans, and to sweeten the straw-chaff with an infusion of these palatable bean-pods. They need not be ground into powder, but it will suffice to pass them through a chaff-cutter, or to cut them by hand into half-inch or inch pieces. Boiling, or even moderately warm, water poured upon the broken locust-beans, and allowed to remain in contact with them for a couple of hours, readily extracts the sugar, in which these bean-pods are very rich; and this infusion, together with the more or less exhausted locust-beans, may then be poured over straw-chaff, which thereby will be rendered quite as palatable to stock as by employing syrup as a sweetener, if not more so.

Locust-beans, as will be seen by the following analysis, which was made in my laboratory some time ago, and which fairly represents their average composition, contain in round numbers fully half their weight of sugar. In consequence they are very palatable, and much liked by every kind of farm-stock.

Average Composition of Locust or Carob-beans.

Moisture	17·11
Oil	1·19
Sugar	51·42
Mucilage and digestible fibre	13·75
*Albuminous compounds	7·50
Woody fibre (Cellulose)	6·01
Mineral matter (ash)	3·02
	100·00
* Containing nitrogen	1·20

Weight for weight, locust-beans contain nearly as much sugar as molasses. In addition to sugar, they contain a little oil, a moderate amount of albuminous or flesh-forming matters, and about 14 per cent. of mucilage and digestible fibre, or altogether 83 per cent. of solid feeding-matter; whereas treacle contains no appreciable amount of albuminous substances, and only from 54 to 60 per cent. of dry feeding-matter, consisting mainly of sugar.

At present locust-beans can be bought at about 7*l.* 10*s.* per ton, whilst treacle or molasses of good quality costs about 9*l.* per ton. Locust-beans are thus not only much cheaper than molasses, weight for weight, but they likewise possess a higher nutritive value, and are equally well adapted to the sweetening of unpalatable bulky food.

Nitrogenous Food-constituents.—In the next place we have to consider the nutritive value of the albuminous or nitrogenous constituents of food. It is admitted on all hands that a certain amount and proportion of nitrogenous matter is essential in the food of all animals. Foods, like locust-beans, or rice-meal, or dari-grain (a species of sorghum), which contain less than 8 or 9 per cent. of albuminoids, are too poor in nitrogenous substances to suit the requirements of the animal. Hence these and a few other feeding materials equally poor in nitrogen should not be given to fattening stock in too large proportions, or without the addition of other meals, or of oilcakes, richer in nitrogenous compounds.

In wheat, oats, and barley, however, the proportion of albuminous substances is sufficiently high to meet the requirements of fattening stock; and in leguminous seeds (such as beans, lentils, and peas), and in oilcakes, the proportions of these compounds are considerably in excess of the requirements of the animal.

According to the views of not a few writers on agricultural chemistry and physiology, it is chiefly the proportion of the nitrogenous, or so-called flesh-forming substances contained in different kinds of food, which determines their comparative value for feeding purposes.

If I am not mistaken, it was Boussingault who made the first attempt to construct a theoretical table of the nutritive value of articles of food, based upon the amount of nitrogen they contain; but it is due to this most careful observer to mention, that in testing the correctness of his own tables by actual feeding experiments, Boussingault frequently found the results of the experiments at variance with the theoretical indications of his tables; and he frankly confessed that the amount of nitrogen in a feeding substance must be regarded as one factor only in estimating its nutritive value.

Presuming that the proportion of nitrogenous substances in the food given to fattening-stock is about the same as that in which we find them to exist in cereal grains, it may be asked, what will be the effect upon the animal when it receives in addition feeding materials rich in nitrogen; or, on the other hand, when it is more liberally supplied with food which is, comparatively speaking, poor in nitrogen and rich in readily digestible starchy or sugary compounds?

Will the increase in the live-weight be determined by the excess of the nitrogenous, or by that of the non-nitrogenous constituents (the carbon-hydrates) of food? These questions can only be answered satisfactorily by experience; and numerous carefully conducted feeding experiments, as well as the experience of fatteners of stock on a large scale, have clearly decided the fact, that the comparative feeding value of most of our stock-foods depends more upon the proportion of the digestible non-nitrogenous substances (or carbon-hydrates) which they contain, than upon their richness in albuminous or nitrogenous compounds.

A few examples will show that it is not the proportion of nitrogenous matter in articles of food of the same or similar kind which regulates their comparative nutritive value. Tail-wheat is richer in nitrogen than fine plump wheat, yet nobody I suppose would use tail-wheat for fattening purposes if he could get wheat rich in starch, producing much flour in the mill, at the same price as inferior samples. I well remember that, a good many years ago, the late Mr. Henry Stephens, author of the 'Book of the Farm,' sent me, for analysis, two samples of wheat, and requested me to determine their comparative value. My report was made in accordance with the then all but general theory, that the proportion of nitrogen in different samples of the same kind of food regulated their comparative value; and having found a good deal more nitrogen in one than in the other of the two samples of wheat, to my surprise I was subsequently informed by Mr. Henry Stephens that the sample which I pronounced to be a good deal the more nutritious, in point of fact was tail-wheat, and the other a much superior and more highly priced wheat.

Again, grass from irrigated meadows, or Italian rye-grass grown with sewage, invariably contains more nitrogen than grass from dry pastures, or rye-grass grown without manure; but no good farmer prefers the grass from irrigated meadows, or rye-grass forced by town sewage, to the better matured and less nitrogenous produce of non-irrigated land.

The same remarks apply with equal force to the comparative feeding-value of mangolds, swedes, turnips, and other root-crops. It is not the proportion of nitrogenous matter in roots, but their percentage of sugar and other equally digestible non-nitrogenous constituents which regulates their comparative feeding-value. Thus the percentage of nitrogen in monster roots, weighing over 15 lbs., is larger than that in roots of the same kind, but weighing only from 3 to 4 lbs., and everybody knows that abnormally big roots possess very little feeding-value. Or if we compare the practical feeding value of beans and peas on the one hand, with wheat or oats on the other, we do not find the fattening qualities, or the power to produce butcher's meat, of leguminous seeds superior to those of the cereal grains mentioned, although the former contain about twice as large a proportion of nitrogenous compounds as the latter.

Again, the nutritive or fattening value of various kinds of oilcakes does not depend so much upon the relative proportions of albuminous or nitrogenous substances in them, as upon the larger or smaller amount of readily digestible non-nitrogenous food-constituents which they severally contain. If it were otherwise, decorticated cotton-cake, which contains fully 2 per cent. more nitrogen than the best linseed-cake, would have been found in practice more valuable for feeding purposes than the latter, which we know is not the case; and rape-cake also would have to be regarded as superior to linseed-cake in feeding value.

Woody Fibre.—The least valuable of the constituents of cattle-food is woody fibre. Bulky feeding materials, such as straw and chaff, and certain kinds of mill-refuse obtained in preparing wheaten flour, oatmeal, rice, &c., for human consumption, contain considerable proportions of woody fibre or cellulose. The larger the proportion of woody fibre, and the more indurated its condition, in articles of food, the less is their practical feeding-value.

The tender cellular fibre of well-ripened turnips, mangolds, and other root-crops, the cellular fibre of grasses, and the woody fibre of the straw of cereal crops, reaped somewhat green, or before the cereal grains have arrived at full maturity, however, is digestible by herbivorous animals in a large measure, and to a larger extent by horned cattle than by sheep. Consequently it possesses a certain nutritive value which is greater or smaller according to the degree of induration in which it occurs in the food.

Mineral Constituents of Food.—Although the mineral- or ash-constituents of food play an important function in the animal economy, as explained already, we need not take special account of them in considering the comparative nutritive value of the various food-constituents, for all our ordinary stock foods contain an ample supply of mineral matter to meet the requirements of the animal.

It is worthy of observation, however, that articles of food, such as the seeds of leguminous plants, rich in nitrogenous constituents, and specially well adapted as food for young growing stock or for milch-cows, contain more phosphate of lime than feeding materials which are richer in non-nitrogenous substances, and therefore more suitable for fattening stock. Provision is thus made, in food which is rich in nitrogenous substances, to meet the extra demand of young stock for the mineral matter of the bony structure.

From the preceding observations it will be gathered that the following is the order of the nutritive value of the constituents of food.

1. Oil and fatty matters.
2. Sugar, starch, and analogous carbon-hydrates.
3. Albuminous or nitrogenous compounds.
4. Digestible cellular fibre.
5. Indigestible woody fibre.
6. Mineral matters or ash.

MANURIAL VALUE OF PURCHASED FOOD.

Practical men are well aware that the manure produced by fattening stock liberally supplied with corn or cake possesses greater fertilising powers than the dung from store-cattle; and they also know in a general way that the manure produced by cattle or sheep fed upon cake in addition to roots is more valuable than that of animals fed upon roots and hay alone.

In the selection of purchased foods for stock, it is important to consider how much of the cost-price of the food should be charged to the manure account, and how much should be allowed for its feeding-value. This is by no means an easy matter, for although it may be ascertained which are the elements of the food that pass into the dung, and their relative proportions may be determined with tolerable precision, the practical benefit resulting from the use of the dung produced from various kinds of food will greatly vary on light and on heavy land, and on different soils varying much in their physical and chemical properties. Hence it is difficult to put upon the manure a money-value which will be generally accepted as correct. However, the only way to escape from this difficulty appears to be to value the fertilising constituents of the food which pass into the dung at the rates at which they can be severally bought in the manure-market, and to adopt subsequently such modifications of the total estimated value as may be suggested by the experience of farmers residing in different localities.

Generally speaking, different articles of food of the same class differ far less in their feeding-value than in their manure-value. For instance, it will make comparatively little difference, so far as the increase in the live-weight of the animal is concerned, whether, in addition to a liberal supply of their ordinary bulky food, such as straw and turnips, a ton of linseed-cake, or a ton of decorticated, or of undecorticated, cotton-cake, or a ton of corn, be given to fattening oxen or sheep; but the value of the manure resulting from the consumption of a ton of each of these foods will show great differences.

The manurial value of food depends mainly on the amount of, 1st, nitrogenous matter, 2nd, potash, and 3rd, phosphoric acid which passes through the body into the dung of the animals. Practically speaking, the whole of the potash and phosphoric acid contained in the purchased food pass into the dung of fattening-stock. The loss in nitrogen which the food sustains passing through the animal has been variously stated by different experimenters. By some it is estimated at one-tenth, by others at one-sixteenth part of the total amount of the nitrogen in the food; the former estimate probably is the more accurate. On the whole, no great mistake will be made if it be assumed that 90 per cent. of the total amount of nitrogen of such concentrated food as oilcake, when given to fattening-stock, is recovered in the solid and liquid excrements, presuming that these can be collected without loss.

In the case of young stock or milking-cows not over well supplied with concentrated purchased foods, the dung will not be quite so valuable as that of fattening-stock, inasmuch as a small proportion of the nitrogenous and phosphatic food-constituents will be stored up during the increase in the live-weight of the young animal, or will be expended in the production of milk; still, even in the case of growing store-cattle or milking-cows, by far the larger proportion of the nitrogen and the phosphates of the food will be rejected in the solid and liquid excrements.

It is well to bear in mind that the estimated manure-value of purchased foods has nothing to do with mere speculation, but rests upon well-ascertained facts, brought to light by numerous feeding experiments in this and other countries. The rate of valuation that may be adopted by different persons may vary; but the statements that the food of fattening-stock, in passing through the animal, loses little (if any) of its nitrogen by exhalation, and none of its mineral constituents, and that, practically speaking, the whole of the mineral matter and about nine-tenths of the nitrogen of the food are recovered in the dung and urine of the animal, are based on carefully ascertained facts. In this country, a long series of most carefully conducted and intelligently conceived feeding experiments have been made by Mr. Lawes, of Rothamsted. These experiments extended over several years, and they were carried out at great expense, with a variety of feeding-stuffs which were given to oxen, sheep, and pigs, care being taken to put up a sufficient number of fattening animals to eliminate the irregularities arising from the different feeding capabilities of individual animals. The food consumed was carefully analysed, the gain in the live-weight noted, and the loss in food by respiration ascertained; and the amount and quality of the manure produced by the consumption of various foods were determined by laborious weighings and analyses.

In illustration of this part of my subject, I may be permitted to quote the following tabulated results (p. 219), which are copied from one of Mr. Lawes's important and highly interesting published papers relating to experiments upon fattening beasts, sheep, and pigs.

It will be noticed that the greater portion of the nitrogenous and mineral matters of the food is recovered in the manure, and that the greater part of the non-nitrogenous substances is lost by respiration and other exhalations, whilst a comparatively small proportion of the nitrogenous substance and of the mineral matter of food is retained in the increase.

It will further be observed that for a given amount of increase produced, oxen void more as manure, and expend more in respiration, &c., than sheep; and sheep very much more than pigs. And lastly, that for a given weight of dry substance consumed, oxen void more as manure than sheep, and sheep much more than pigs; but oxen respire rather less than sheep, and sheep rather less than pigs.

The proportions of certain constituents in a ton of various articles of food which are stored up in the animal, and the proportions which pass into the manure by the consumption of a ton of different kinds of food, have thus been ascertained with tolerable precision by actual experiments. If, therefore, the composition of the various kinds of food that are given to fattening-animals is known, we can determine beforehand, without actually analysing the manure produced from the consumption of a ton of each kind, how much nitrogen, potash, and phosphoric acid existing in the food will be recovered in the manure produced. And as nitrogen (or its equivalent expressed as ammonia), potash, and phosphoric acid (or its equivalent expressed as phosphate of lime), have a certain market-value as manuring constituents, we can likewise ascertain the money-value of the manure produced from the consumption of a ton of any of the ordinary stock foods, the average composition of which has been ascertained.

By allowing 8*d.* per lb. for ammonia, 2*d.* per lb. for potash, and

1. Oxen.

	250 lbs. Oilcake, 600 lbs. Clover Chaff, 3500 lbs Swedes — Produce 100 lbs. Increase, and Supply.				100 Total Dry Substance of Food Supply.			Amount of each Constituent stored up, for 100 of it consumed.
	In Food.	In 100 lbs. Increase.	In Manure.	In Respiration, &c.	In Increase.	In Manure.	In Respiration, &c.	
	lbs.	lbs.	lbs.	lbs.				
Nitrogenous substance	218	9·0	323·0	636	0·8	29·1	57·3	4·1
Non-nitrogenous substance	808	58·0			5·2			7·2
Mineral matter	83	1·6	81·4	..	0·2	7·4	..	1·9
Total dry substance	1109	68·6	404·4	636	6·2	36·5	57·3	..

2. Sheep.

	250 lbs. Oilcake, 300 lbs. Clover Chaff, 1000 lbs. Swedes — Produce 100 lbs. Increase, and Supply.				100 Total Dry Substance of Food Supply.			Amount of each Constituent stored up, for 100 of it consumed
	In Food.	In 100 lbs. Increase.	In Manure.	In Respiration, &c	In Increase.	In Manure.	In Respiration, &c	
	lbs.	lbs.	lbs.	lbs.				
Nitrogenous substance	177	7·5	229	548·5	0·8	25·1	60·1	4·2
Non-nitrogenous substance	671	63·0			7·0			9·4
Mineral matter	61	2·0	62	..	0·2	6·8	..	3·1
Total dry matter	912	72·5	291	548·5	8·0	31·9	60·1	..

3. Pigs.

	500 lbs. Barley Meal, Produce 100 lbs. Increase, and Supply.				100 Total Dry Substance of Food Supply.			Amount of each Constituent stored up, for 100 of it consumed.
	In Food.	In 100 lbs. Increase.	In Manure.	In Respiration, &c.	In Increase.	In Manure	In Respiration, &c.	
	lbs.	lbs.	lbs.	lbs.				
Nitrogenous substance	52	7·0	59·8	276·2	1·7	14·3	65·7	13·5
Non-nitrogenous substance	357	66·0			15·7			18·5
Mineral matter	11	0·8	10·2	..	0·2	2·4	..	7·3
Total dry matter	420	73·8	70·0	276·2	17·6	16·7	65·7	..

1*d.* per lb. for phosphate of lime, rates which fairly represent the present market-value of these fertilising constituents, the value of the manure obtained by the consumption of different articles of food may thus be estimated with sufficient accuracy to be of considerable service in a practical point of view. Proceeding on this basis, Mr. Lawes constructed a table in which the estimated money-value of the manure from one ton of most ordinary articles of food is given. This table will be found on page 11 in Mr. Lawes's paper on the "Valuation of Unexhausted Manures," published in Vol. XI., Part 1 (No. XXI.), of this Journal.

In illustration of the mode in which the manurial- and money-value of the various feeding-stuffs mentioned in Mr. Lawes's tables has been estimated, I wish to direct attention to the subjoined tabular statement, which gives the average composition of good linseed-cake, decorticated and undecorticated cotton-cake, rape-cake, barley-meal, and barley-straw.

TABLE II.—*Showing the Average Composition of certain Foods.*

	Linseed-cake.	Decorticated Cotton-cake	Undecorticated Cotton-cake.	Rape-cake.	Barley-meal.	Barley-straw.
Moisture	12·00	10·00	11·00	11·00	16·00	15·00
Oil	11·50	14·00	6·00	10·00	2·50	1·50
*Albuminous compounds ..	29·70	40·60	22·50	31·25	10·50	3·00
Mucilage, starch, and digestible fibre	27·80	20·90	33·50	28·75	61·80	34·00
Woody fibre	12·00	6·50	21·00	11·00	7·00	42·00
†Mineral matter (ash)	7·00	8·00	6·00	8·00	2·20	4·50
	100·00	100·00	100·00	100·00	100·00	100·00
*Containing nitrogen ..	4·75	6·50	3·60	5·00	1·65	·50
Equal to ammonia	5·75	7·90	4·37	6·07	2·00	·60
†Containing potash	1·65	3·12	2·00	1·76	·55	·63
and phosphoric acid equal to phosphate of lime .	4·92	7·00	4·50	5·75	1·33	·37

Assuming the loss of nitrogen in the consumption of the cakes to amount to one-tenth of what they contain, and to 15 per cent. in the case of barley-meal and barley-straw, and making slight allowance for the loss in potash and phosphate of lime, Mr. Lawes has calculated the amount of ammonia, potash, and phosphate which will pass into the manure resulting from the consumption of the several kinds of food.

Thus he has calculated to exist, in the manure from one ton of linseed-cake, decorticated cotton-cake, and barley meal respectively—

	Linseed-cake.	Decorticated Cotton-cake.	Barley-meal.
	lbs.	lbs.	lbs.
Ammonia	116·3	159·1	38·1
Potash	36·4	69·2	12·1
Phosphate of lime	104·7	149·0	28·7

At 8*d.* per lb. for ammonia, 2*d.* per lb. for potash, and 1*d.* per lb. for phosphate of lime, the preceding quantities of these constituents in the manure from a ton of these three kinds of food are worth—

	In Linseed-cake.			In Decorticated Cotton-cake.			In Barley-meal.		
	£	s.	d.	£	s.	d.	£	s.	d.
Ammonia	3	17	6	5	6	1	1	5	6
Potash	0	6	3	0	11	6	0	2	0
Phosphate of lime	0	8	9	0	12	5	0	2	6
Total money-value of the manure from 1 ton of food	4	12	6	6	10	0	1	10	0

In a similar manner the manure-value of a ton of undecorticated cotton-cake has been estimated at 3*l.* 18*s.* 6*d.*; that of rape-cake, at 4*l.* 18*s.* 6*d.*; and that of barley-straw at 10*s.* 9*d.* per ton.

The present price of linseed-cake in London is 12*l.* 10*s.* per ton; of decorticated cotton-cake, 10*l.* per ton; undecorticated cotton-cake, 8*l.*; rape-cake, 8*l.* 15*s.*, and barley-meal, 9*l.* 5*s.* per ton.

It will be seen that whilst the estimated value of the manure resulting from the consumption of a ton of rape-cake, selling at 8*l.* 15*s.* per ton, is 4*l.* 18*s.* 6*d.*, the manure-value of a ton of barley-meal, costing 9*l.* 5*s.* per ton, is only 1*l.* 10*s.* The price of linseed-cake is 12*l.* 10*s.* per ton, and its estimated manure-value, 4*l.* 12*s.* 6*d.*; whilst decorticated cotton-cake, which is sold at present in London at 10*l.* per ton, has a manurial value of 6*l.* 10*s.* The market prices of these and other feeding-stuffs thus have little connection with their manure-value. Deducting the value of the fertilising matters resulting from the consumption of the preceding articles of food from their respective market price, the feeding-value of linseed-cake would be 12*l.* 10*s.* minus 4*l.* 12*s.* 6*d.*, or 7*l.* 18*s.* 6*d.* per ton; that of decorticated cotton-cake 10*l.* minus 6*l.* 10*s.*, or 3*l.* 10*s.* a ton; whilst the feeding-value of undecorticated cotton-cake will be 8*l.* minus 3*l.* 18*s.* 6*d.*, or 4*l.* 2*s.* 6*d.* a ton; that of rape-cake, 8*l.* 15*s.* minus 4*l.* 18*s.* 6*d.*, or 3*l.* 16*s.* 6*d.* a ton, and that of barley-meal, 9*l.* 5*s.* minus 1*l.* 10*s.*, or 7*l.* 15*s.* Whatever value may attach to the preceding estimates of the feeding- and manure-value of different cakes and of barley-meal, they afford convincing evidence of the importance of taking into account the manure-value of purchased foods in estimating their comparative total money-value.

In my intercourse with agriculturists I have frequently met with intelligent and otherwise well-informed persons who have openly confessed that they had not much faith in Mr. Lawes's estimates of the manurial value of purchased food. In their minds evidently lurked the idea that these estimates are in a great measure fanciful, and rest on no solid foundation. It cannot therefore be stated in too plain language that the recognised superior fertilising properties of the manure of fattening stock fed upon cake is mainly due to the high percentage of its nitrogenous constituents, and that by far the greater portion of the nitrogen of the food is recovered in the manure. Associated with nitrogenous substances we always find phosphates and potash; and food rich in nitrogenous substances will generally also produce manure richer in phosphates and potash, than food which is comparatively poor in nitrogenous constituents.

The fact that decorticated cotton-cake is very rich in nitrogen, and also contains a good deal of phosphate of lime, is undisputed; nor is anybody likely to deny that the superior fertilising properties of this description of cake depend mainly upon its richness in nitrogen. It is chiefly for the purpose of supplying available nitrogenous food that rape-cake is employed as a manure for cereal crops.

On the light lands of Norfolk, in many parts of Kent, in some localities in Cambridgeshire, and in some other counties of England, rape-cake is a favourite manure with many farmers; and they willingly pay 6*l.* per ton for manure rape-cake, which on an average contains not more than about 4½ per cent. of nitrogen, or somewhat less than good green German feeding rape-cake. It is well known that rape-cake, and other residual cakes from the presses of oil-crushers, decompose with facility in light and porous soils, furnishing thereby readily available food to plants, whilst on retentive clay-soils the decomposition of such cakes is too slow to meet the requirements of those crops which are specially benefited by nitrogenous food. Applied direct to light land, rape-cake thus has a greater practical manure-value than on heavy land. Although it may pay a farmer to give 6*l.* a ton for rape-cake on certain descriptions of soils, I cannot help thinking that not quite so much would be given for it if rape-cake were not held generally in great esteem as a remedy against wire-worm. As a direct manure, rape-cake is certainly dear at 6*l.* a ton; and it would pay better a farmer who requires cake as a manure to buy slightly damaged or mouldy decorticated cotton-cake, which occasionally is offered in the market at 6*l.* 10*s.* to 7*l.* per ton. Decorticated cotton-cake contains nearly one-half more nitrogen, and considerably more potash and phosphate of lime, than an equal weight of manuring rape-cake; if a farmer, therefore, finds it answer his purpose to pay 6*l.* per ton for the latter, the fertilising ingredients in a ton of decorticated cotton-cake, in comparison with those in manure rape-cake selling at 6*l.* per ton, will be worth to him one-half more, or 9*l.* per ton; and, consequently, decorticated cotton-cake at 6*l.* 10s. or 7*l.* a ton will be a much cheaper manure than rape-cake at 6*l.* a ton.

Manure rape-cake presents an example showing that the theoretical or estimated manure-value of the cake does not necessarily coincide with its practical value or its actual price on the market. In the case of rape-cake the estimated manure-value amounts only to about 4*l.* 10*s.* per ton, whereas 6*l.* is actually paid for it by farmers who are in the habit of using it for manuring purposes.

On the other hand, the practical money-values of the manure produced from the consumption of various foods, I am inclined to think, are much below the estimated values as given in Mr. Lawes's table. In attempting to get some better insight into the commercial manure-value of various foods, I believe considerable deductions will have to be made from their estimated money-value.

My reasons for entertaining this view are the following:— In the first place, the nitrogenous constituents of food which pass into the manure of fattening-stock occur in it only partially in the form of ammonia-salts, by far the greater part existing in a variety of organic combinations, yielding their nitrogen in the shape of ammonia less rapidly than the salts of ammonia, though some more rapidly than others; whereas the estimated manure-value of purchased foods is calculated on the supposition that the whole of their nitrogenous constituents which is recovered in the manure exist in it in the shape of ammonia. Now the practical fertilising effects of nitrogen in the form of ammonia, it is admitted on all hands, are more energetic, and manifested by a more rapid action on vegetation than the same amount of nitrogen applied to the land in the shape of nitrogenous organic matters. In other words, nitrogen in the shape of ammonia-salts has a greater money-value than nitrogen in combination with organic matter. A higher price, for instance, is paid for the nitrogen in sulphate of ammonia than for the nitrogen in blood or for the nitrogen in shoddy. Too high a value for practical purposes, therefore, is put upon the manure-constituents of purchased foods if the calculation is made on the supposition that the whole of the nitrogen recovered in the manure from their consumption exists as ready-formed ammonia, for which an allowance at the rate of 8*d.* per lb. is made.

In the second place, I would notice that 8*d.* per lb. is the market price at which ammonia is sold at present in concentrated portable manures, but that its money-value is much less when offered for sale in bulky fertilisers, in which a comparatively small amount of ammonia, say 2 per cent., has to be taken with a large proportion of water and bulky materials of no great fertilising value. The manurial residue of 1 ton of linseed-cake given to feeding beasts with straw and roots would be distributed through several tons of farmyard-manure. After purchasing such voluminous manuring matters, expense must be incurred for carriage and for their distribution upon the land. All this is saved to the farmer who buys the ammonia he wishes to apply to his crops in the shape of concentrated portable manure, which admits of ready application to the land, and can be placed upon it where it is most wanted, that is, in more direct contact with a starting crop than is the case with farmyard or bulky compost manures, which have to be ploughed in and mixed with a large portion of the soil. The practical advantages obtained by the use of concentrated or portable manures, in enabling the farmer to incorporate them with only a small portion of the soil in more direct contact with the starting crop, receive a practical acknowledgment in the higher comparative price which practical men find it answer their purpose to pay for ammonia in concentrated ammoniacal manures than they have to give for the same amount of ammonia in bulky manures.

A reference to the composition of ordinary farmyard-manure, and the price at which it is usually sold, I trust will put this argument in a clear light.

According to analyses made by me many years ago, the composition of fresh and rotten farmyard-manure, being the mixed manure of horses, cows, and pigs, is the following:—

Composition of Farm-yard Manure (composed of Horse-, Cow-, and Pig-Dung).

		Fresh Dung.		Rotten Dung.
Water		66 17		75·42
*Soluble organic matter		2·48		3·71
Soluble inorganic matter:—				
Soluble silica	·237		·254	
Phosphate of lime	·299		·382	
Lime	·066		·117	
Magnesia	·011		·047	
Potash	·573		·446	
Soda	·051		·023	
Chloride of Sodium	·030		·037	
Sulphuric acid	·055		·058	
Carbonic acid and loss	·218		·106	
		1·54		1·47
†Insoluble organic matter		25·76		12·82
Insoluble inorganic matter:—				
Soluble silica	·967		1·424	
Insoluble siliceous matter	·561		1·010	
Oxide of iron and alumina, with phosphate	·596		·947	
Containing phosphoric acid	(·178)		(·274)	
Equal to phosphate of lime	(·386)		(·573)	
Lime	1·120		1·667	
Magnesia	·143		·091	
Potash	·099		·045	
Soda	·019		·038	
Sulphuric acid	·061		·063	
Carbonic acid and loss	·484		1·295	
		4·05		6·58
		100·00		100·00
* Containing nitrogen	·149		·297	
Equal to ammonia	·181		·360	
† Containing nitrogen	·494		·309	
Equal to ammonia	·599		·375	
Total nitrogen	·643		·606	
Equal to ammonia	·780		·735	
The manure contains ammonia in a free state	·034		·046	
The manure contains ammonia in form of salts	·088		·057	

It will be observed that both fresh and rotten farmyard-manure contain but very small proportions of either free or combined ammonia. Nearly the whole of the nitrogen in the dung exists as nitrogenous organic matter. In fresh dung the greater portion of the nitrogenous substances are insoluble in water, and in the rotten dung about one-half of the nitrogenous matters are soluble, and the other half insoluble in water.

As the manure analysed was produced by well-fed animals, liberally supplied with cake and corn, in addition to hay and chaff, we may presume that manure obtained by the consumption of all kinds of purchased food, in addition to ordinary farm-produce, would be of a similar character, and approach in composition the fresh and rotten dung analysed by me, and consequently would contain very little ammonia, either in a free state or in the form of ammonia and salts.

Now, if we express the whole of the nitrogen in dung in its equivalent of ammonia, and allow 8*d.* per lb. for ammonia, and estimate the potash in the manure at the rate of 2*d.* per lb., soluble phosphate of lime at 2*d.*, and insoluble phosphate of lime at 1*d.* per lb.—which certainly are moderate rates for these constituents when they occur in concentrated artificial manures—and at these rates calculate the money-value of a ton of fresh and rotten dung, we obtain the following results.

According to the preceding analysis a ton of rotten farmyard-manure contains:—

	s.	*d.*
8½ lbs. of soluble phosphate of lime, worth, at 2*d.* per lb. ..	1	5
13 „ insoluble phosphate of lime, „ 1*d.* „ ..	1	1
11 „ potash, „ 2*d.* „ ..	1	10
Nitrogen equal to 16½ lbs. of ammonia, calculating ammonia at 8*d.* per lb.	11	0
Total estimated money-value of a ton of rotten dung ..	15	4

In a ton of fresh farmyard-manure we have :—

	s.	*d.*
6½ lbs. of soluble phosphate of lime, worth, at 2*d.* per lb. ..	1	1
8½ „ insoluble phosphate of lime, „ 1*d.* „ ..	0	8½
13 „ potash, „ 2*d.* „ ..	2	2
Nitrogen equal to 17½ lbs. of ammonia, calculating ammonia at 8*d.* per lb.	11	8
Total calculated money-value of a ton of fresh dung ..	15	7½

It thus appears that if we estimate the money-value of good farmyard-manure according to the same rates at which the principal fertilising constituents in the dung can be bought in concentrated artificial manures, 1 ton of farmyard-manure would be worth in round numbers 15*s.* However, good dung can be bought in many places at 5*s.* per ton, or one-third its estimated money-value; and probably the highest price which a farmer would be inclined to pay for good dung would not exceed 7*s.* 6*d.* per ton, or one-half its estimated money-value. The difference between the estimated money-value of farmyard-manure (calculated at the market rate of the constituents when sold as concentrated artificial manures), and the actual market price, may be fairly taken to represent the difference in practical value caused by the greater expense of the carriage and application of farmyard-manure, and the less vigorous action of organic nitrogenous compounds as compared with ammonia salts.

It is evident, therefore, that the manuring-constituents of purchased food, which are recovered in the manure from farm-stock in this bulky and less available form, possess a much lower practical or market value than the estimated manure-value which different stock-foods are assumed to possess in Mr. Lawes's table. Mr. Lawes's estimate of the manure-value of different kinds of feeding-stuffs, however, are based on carefully ascertained facts, and, so far, have a permanent value, affording important and useful data for comparative valuations. But in their application in practice, it appears to me, that we shall be nearer the mark if we deduct from 30 to 40 per cent. from the estimated money-value which is given in the table to the manure-constituents of a ton of the several articles of food, in order to arrive at the additional practical value in the land which is given to several (or a good many, say, 15 to 20) tons of farmyard manure by the consumption of a ton of those several articles of food. Mr. Lawes is fully alive to the fact that it is not possible to recover in practice the full estimated manure-value of purchased food, for in his valuable paper on the "Valuation of Unexhausted Manures," in Part I., Vol. XI. of this Journal, he says, at page 12, "If purchased food be consumed with a root-crop by the outgoing tenant, and he take no crop grown by the manure produced, he should be allowed compensation at the rate of 17*s.* for every 20*s.* of the original manure-value of the food if it have been consumed on the land, or 16*s.* if consumed in the yards." Mr. Lawes thus makes a deduction of 20 per cent. from the calculated manure-value of purchased food; whilst I am inclined to allow the larger deduction of from 30 to 40 per cent, if the food be made into bulky farmyard-manure, the market-value of which, we have seen, is scarcely one-half that of its calculated money-value. On the other hand, if the food be consumed by sheep, with a root-crop, practically no loss in manuring elements is sustained when the urine and solid excrements of sheep are spread at once on the land, without being first put up into a dung-heap, like the excrements of cattle kept in yards or feeding-stalls; no additional expense is incurred in carting, distributing, and ploughing-in the manure, and in that case Mr. Lawes's estimated manure-value of linseed and similar concentrated nitrogenous articles of food, with a deducion of 20 per cent., I believe, gives a fair and correct estimate of the practical manure-value of oilcakes, and similarly constituted food.

The composition of feeding materials certainly affects their nutritive and manurial properties; at the same time the mere proximate analysis of an article of food does not give a sufficient insight into its real economical value. There is nothing, for instance, on the face of comparative analyses of linseed- and rape-cake which affords any indication of the great difference in the money-value of the two kinds of cake. Rape-cake contains nearly as much oil as linseed-cake, and rather more albuminous substances, and not a much larger proportion of indigestible fibre; and there is nothing in the analytical results representing the composition of the two cakes contrary to the supposition that the one is as valuable a feeding cake as the other; and yet the market price of linseed-cake is 12*l.* 10*s.*, and that of feeding rape-cake about 8*l.* 10*s.* to 8*l.* 15*s.* per ton.

For certain purposes it is true that rape-cake is quite as useful as linseed-cake. For instance, for young growing stock, or as an auxiliary food for milch-cows, rape-cake goes as far as an equal weight of linseed-cake; but general preference is given to the much more expensive linseed-cake as a food for fattening-stock.

This preference cannot reasonably be ascribed to blind prejudice; for surely fatteners of stock would prefer to buy cake at 8*l.* 10*s.* per ton, if it answered their purpose as well as cake which is sold at 12*l.* 10*s.* per ton? The reasons which decide men to use linseed-cake in preference to rape-cake, in order to fatten off oxen or sheep for the butcher, lie close at hand, if we look practically into this matter. The art of getting an animal ready for the butcher in the shortest possible time may be said to consist in passing through it the largest possible amount of well selected, properly prepared, and readily digestible food. These conditions are given in a mixed food, of which linseed-cake forms no inconsiderable item. Fattening-oxen or sheep are fond of this cake, do well upon it, and consume large quantities. On the other hand, accustomed to palatable, readily digestible food, fattening-beasts dislike the bitter, and somewhat acrid, taste of rape-cake, and in consequence do not eat more of it than they can help; and altogether do not get on so well upon rape- as upon linseed-cake.

Bearing in mind that fully one-half of the weight of the food supplied to animals is wasted by respiration and other exhalations, and that the longer an animal is kept in the feeding-stall the larger the waste in food, it is clearly a good policy to give to fattening-stock a food which agrees with their appetite and digestive powers. Notwithstanding its higher price, linseed-cake in the end is a more economical food than rape-cake, if it be used in the later stages of the fattening process, as a means of bringing on the animal rapidly for the butcher. Similar purely practical considerations frequently decide the choice of feeding matters, and in a large measure influence their market-value. Another example illustrating the truth of the preceding remarks is presented to us in cotton-cake. On comparing the composition of decorticated with that of undecorticated cotton-cake, it will be noticed that the former contains on an average 14 per cent. of oil, 40½ per cent. of albuminous substances, and only 6½ per cent. of indigestible woody fibre, whilst undecorticated cotton-cake contains only 6 per cent. of oil, 22½ per cent. of albuminous matters, and as much as 21 per cent. of indigestible fibre. There is thus a great difference in the apparent feeding properties of the two kinds of cake. Moreover, the estimated money-value of the manuring matters produced by the consumption of a ton of decorticated cotton-cake amounts to 6*l.* 10*s.*, whilst the estimated manure-value of the undecorticated cake is only 3*l.* 18*s.* 6*d.* per ton; the difference in the manuring-value alone of the two cakes thus amounts to 2*l.* 12*s.* 6*d.* We might therefore expect that decorticated cotton-cake would be sold at a much higher price than undecorticated; but the actual market-price of the former is 10*l.* per ton, and of the latter 8*l.* per ton. The difference in the manure-value alone of the two kinds of cake thus is greater than the difference in the price at which the two are sold at present, while the much higher feeding value of decorticated cake is not represented in the market price. The explanation of this apparent anomaly is in part found in the circumstance that decorticated cotton-cake is too rich in albuminous substances to suit the constitution of herbivorous animals, and in consequence is too indigestible to be given to stock in the same way in which linseed-cake is usually administered. Most agriculturists have as yet to learn how to make the most of this species of cake, which is produced only to a limited extent, and not so largely employed for feeding purposes as undecorticated cotton-cake. Want of experience in the economical use of decorticated cotton-cake no doubt accounts, at least partially, for the fact that it is sold at present below its real value.

The hard husks of cotton-seed have no intrinsic feeding-value, but when reduced to a coarse powder, in the act of crushing the seed for oil, they act as a useful diluent of the extremely rich and too indigestible kernels; and hence the practical feeding-value of cake made from whole seed has been found greater than might be supposed, in comparison with the theoretical value of decorticated cotton-cake. Moreover, the hard woody shells of cotton-seed possess an economical value, in virtue of the astringent principle they contain, which renders whole-seed or English cotton-cake very useful to cattle out on pastures at periods of the year when they are apt to become affected by scour, as well as to stock fed upon an abundance of succulent food, which has a tendency to keep the bowels in too loose a state. In such cases English cotton-cake acts medicinally as a corrective, and this useful property gives a certain value to the undecorticated cake, which that made from the shelled seed does not possess.

Other examples might be readily quoted in support of the fact that the practical or market-value of feeding-stuffs is dependent in a large measure upon the use which the farmer has found by experience to make of them; but sufficient evidence, I trust, has been given in this paper showing that the real market-value of purchased food is affected by purely practical considerations, and that the proximate composition of articles of food, although giving useful hints to the intelligent stock-feeder, does not afford a full insight into their relative merits, nor supply data for estimating with precision their market or money-value.

11, *Salisbury-square, Fleet-street, E.C.,*
January, 1876.

VII.—*Notes on Inoculation of Grass Land, as practised at Kimbolton.* By MORGAN EVANS.

TO those who read the Report on "Laying down Grass Land to Permanent Pasture," in the last half-yearly volume of the Journal, the following communication from his Grace the Duke of Manchester will sufficiently explain the object of this short paper:—

Kimbolton Castle, Huntingdonshire,
November, 1875.

SIR,—In the Report on "Laying down Land to Permanent Pasture," in No. XXII. of the Royal Agricultural Society's Journal, at page 449, Mr. Morgan Evans quotes Mr. P. Purves as follows:—"I should decidedly say that, as a general rule, no occupying tenant can do so (lay down old arable fields for permanent pasture) advantageously, as it will take a lifetime to make good old pasture out of old arable land, and at such an expense as no tenant, even upon an ordinary lease, would encounter." Mr. Evans thinks that this may possibly be an extreme opinion.

The subject in question seems to me so important, that I trust you will allow me to state that I believe Mr. Purves's opinion to be entirely warranted in reference to sowing grass on the stiff clays of this neighbourhood. I think it likely that he had in his mind an experiment that was made in my park shortly before and after 1855, when four fields were laid down in grass with great care. They are not yet good pasture.

At page 450 of the Report, doubts are expressed whether it is desirable in certain places to increase the amount of permanent pasture. I believe that in this neighbourhood it would be desirable.

When the price of corn was high, old grass land was broken up. Even now, when the price of corn is low, and when farmers doubt whether wheat will ever pay, some grass lands are so utterly coarse and unprofitable that it is advisable to break them up. But many of the best farmers in this neighbourhood hold that they have not enough grass. They consider that the most desirable proportion is one-third grass to two-thirds arable.

A few years ago, when I was discussing new terms of agreement with some of my tenants, the question of laying down grass land was touched upon. The advantage of doing so was acknowledged, but it was objected: "Who is to pay for doing so? the landlord will not like to forego his rent, and the tenant cannot pay rent for land that is unprofitable for years." Shortly afterwards, I was struck with the persistency with which grass would come up in a gravel walk I had made across the park, and I was led to consider an economical process of inoculation.

I explained my views to Mr. James Howard, of Bedford, who made a machine for me, which after a few trials and alterations has answered admirably. The process consists in cutting, as it were, a rope of turf out of old pasture. The dimensions of the "rope" are 2 inches broad by about 1½ inch or 2 inches deep. Three "ropes" are cut at once by the implement. They are carted to the field to be laid down, and emptied upon it like farmyard-manure. The "ropes" are broken into pieces 2 inches square, and placed by hand on the ground about 9 inches apart. This is done about the month of November. By the next hay harvest the ground is covered with grass, and the planted tufts are as high as the meadows. The second year it is fit for grazing. After the first year the gaps in the old pasture, from which the turf was taken, are scarcely perceptible.

I enclose an account of the operation by my bailiff, Mr. Wallis, and I should be glad if Mr. Morgan Evans would come and see the result of the experiment.

Your obedient servant,

MANCHESTER.

To the Secretary of the
Royal Agricultural Society.

Laying down Land to Permanent Pasture.

His Grace the Duke of Manchester, to obtain permanent pasture as soon as possible, determined to try inoculation; he therefore had an implement made by Messrs. Howard, of Bedford, for taking up the turf with less injury to the old pasture than is caused by the common plough. It cut three furrows, or rather slices, 4 in. × 4 in., which we cut into lengths of about 4 inches. We then made furrows with the common corn drill 18 inches apart, and planted the pieces of turf the same distance in the rows. But as we proceeded, his Grace thought it would be better to plant them promiscuously (or, as we say, broadcast), we therefore altered to that plan. His Grace thought it would be a further improvement to cut the pieces smaller, and plant them nearer. We therefore had the implement altered to cut the strips of turf 2 in. × 2 in.; these we pulled (not cut) to pieces about 2 inches long, and planted them about 9 inches apart, and thus we planted the remainder of what we did that season (November 1873). As soon as the land was sufficiently dry, we rolled it with a heavy roller, and left it until the spring, when we kept the land clean by frequent hoeings, the tufts growing and spreading well. These we let grow until the seeds were nearly ripe, when we cut it with the mowing machine, shedding a great deal of the seed. The hay was not worth saving, from having stood so long; but the object was attained, viz., to sow the spaces with the natural grass-seeds. After a nice rain it was completely covered with fine grass, which we let grow until the autumn, when we eat it off, but not close, with young horned cattle. The portion we had planted with 4-inch pieces had a rather rough and uneven appearance, though well covered with grass. But that planted with the 2-inch pieces was nearly as level and good as old grass land. The next autumn we therefore proceeded to finish the field with 2-inch pieces; but frost and snow interrupted the work, so we had to leave it until the spring. We planted some in February, but it did not succeed. We therefore ploughed that portion up and gave it another summer's fallow, and we have just finished planting that portion. But that which we planted in November, having been treated in the same manner as the first portion, has the appearance of old grass land, being well covered with natural grasses and white clover, on which we have grazed our dairy cows this autumn.

Of course it is too early to form a decided opinion; as we know that after land has been laid down with the best grass-seeds for a few years it goes off, and do what you may, it will not become a good pasture for the next seven or may be ten years. But judging from present appearances, this does not appear likely to occur in this case. And in regard to expense, we know that to lay down to permanent pasture properly, by sowing, is very expensive, as it is absolutely necessary to thoroughly fallow and well manure the land in both cases; and it is admitted on good authority that it is best to lay down without a crop; the difference is only between planting and sowing, the labour in preparing the land being the same.

And we find that in 1873 it cost 4*l.* 18*s.* for horse work and manual labour to turf 1 a. 3 r. 10 p., or 2*l.* 14*s.* per acre. In 1874, being very bad weather, it cost 9*l.* 14*s.* 6*d.* to do 2 a. 1 r. 25 p., or 4*l.* 1*s.* per acre. In 1875 it cost 2*l.* 10*s.* 4*d.* to do 3 r., or 3*l.* 8*s.* per acre; so that if we had to do a field of, say, ten acres, it would not cost more than 3*l.* per acre, as in doing it in such small pieces, and the weather being so unfavourable in 1874, it cost considerably more than it would under more favourable circumstances. That which was done in 1873 and 1874 already looks better than some that has been laid down with seeds fifteen to twenty years.

JOHN WALLIS.

Kimbolton Park Farm,
November, 1875.

In accordance with the Duke of Manchester's request, I visited Kimbolton Park Farm on the 29th of November last, and inspected the field which had been subjected to the several experiments in inoculation. The plot last treated completes the field, and within a ring fence the effect of the different methods adopted may easily be studied. I have little to add in reference to the general appearance of the sward that is not recorded in the foregoing statements of the Duke of Manchester and his bailiff, Mr. Wallis. I may say, however, that I was much surprised at the rapid development of pasture induced by inoculation. The plot laid down in the autumn of 1873, with the smaller pieces of turf, had a remarkably fresh and healthy appearance. Of the plots that had only passed through one summer, that which was planted in the spring of last year was somewhat patchy, but, on the whole, did not present a worse appearance than fresh seeds on many well-treated soils at the same period of the year, and which afterwards turn out well. But the plot inoculated the previous autumn had a good even sward; the land was completely covered with well-planted, thickly growing grasses, and had a much more substantial character than ordinary seeds only one year old.

Inoculation was first introduced in the early part of the present century, "invented," as it is termed, by Mr. Whitworth, of Acre House, Lincolnshire. It was thought for some time to be a great discovery, and many persons were greatly in its favour, if not, indeed, enthusiastic in advocating its adoption. T. W. Coke, Esq., offered a prize for the encouragement of this "new description of husbandry." The first person who practised the new system to any extent was one of Mr. Coke's tenants, John Blomfield, of Warham, Norfolk. Almost all the original literature on the subject is confined to a work written in 1817 by Mr. Coke's steward, Francis Blaikie, 'On the Conversion of Arable Land into Pasture;' and to a few pages in the late Mr. George Sinclair's 'Hortum Gramineus Woburniensis.' The "new description of husbandry," however, has made but little progress; and so little of a practical nature is generally known of it, that even very modern works on agriculture actually give the labour-expense of the operation as 2*l.* 10*s.* per acre, evidently relying on the authority of Mr. Blyth, of Burnham, Norfolk, who made his calculations so far back as 1816! To strictly follow the old system of inoculation would at the present time cost at least twice, if not thrice the amount thus given.

The Duke of Manchester does not, of course, claim to be the original inventor of inoculation as a means of laying down land to permanent pasture. He may, however, I think, hereafter justly lay claim to having introduced an improved method of practising it, if not to its revival in the present day. According to the invariable instructions under the old system, the turf was pared in breadths of from 6 to 9 inches. To make these parings at all manageable, the land was generally first cut across by the sharp tines of a scarifier, so that as the paring-plough went along in the other direction, large-sized "mats," evenly divided, remained on the land to be removed in the cart to the scene of operations. The turves thus cut were chopped into pieces of three or four inches square by a spade or similar implement, after they had been tipped out of the cart on or near the land in process of being inoculated. The labour in so doing must be enormous. An apparent advance on this system is suggested in Morton's 'Cyclopædia of Agriculture,' where the writer says:—"If, by means of a roller presenting to the ground on which it rests discs with sharp edges at intervals of four inches, the whole surface of a field of good grass be cut to the depth of two or three inches apart, then a paring-plough crossing these lines, and taking alternate 4-inch slices at a depth of two or three inches from the surface of the field, will cut off a large number of bits of turf," &c. But the expense of "picking up the pieces," according to this plan, is by no means to be overlooked. It is not to be wondered at that the increased price of labour has deterred most persons from adopting either method of obtaining the "large number of bits of turf" necessary for the process. The novelty in the Duke of Manchester's system consists in cutting out narrow strips of turf, instead of long mats to be redivided afterwards; and it is a decided improvement on the system of "cut-crossing" small strips of four inches wide. The implement used may in its frame-work be a common scarifier, in which are fixed two bent rectangular tines, which are so adjusted as to cut a strip of sod two inches deep and two inches broad. These ropes may be of any length, and may break in lifting into the cart into any size, for they would seldom break in shorter lengths than two inches at least. Instead of having to cut them into small squares by the spade or other means, which considerably increases the amount of labour, the ropes of turf are readily broken off in suitable sizes by the hands of the women or boys carrying them during the process of plantation. Of old, also, the usual way of marking the land into lines for transplantation was by the use of a scarifier. The introduction of corn-drills allows of a more rapid means of marking the land, by scoring it with the coulters of an empty drill. The women and children, having these lines to guide them (we speak of the system adopted at Kimbolton), use their own judgment in placing the bits of turf at proper distances—irregularly, of course, yet still as a whole carefully and systematically done. The small pieces of turf are pressed down with the foot after they have been placed in position by the hand, and the whole is rolled over soon afterwards, and again at any time it may be deemed necessary—as usually advised when inoculation is practised.

It will be seen by reference to pages 465 and 456 of the preceeding volume of this Journal, that Mr. R. Hodgson Huntley calculates the expense of inoculation at 1*l.* per acre, exclusive of "my horse and drivers." In his experiment he cut the turf into strips of 4 inches broad, and subsequently cut them into 4 inches square. What the labour of horse or horses and drivers cost is not stated. Mr. James Howard (p. 485) stated that he had tried the "inoculation system most successfully;" but added that "it is an expensive method," as surely it must be—especially when not practised in the way advocated by the Duke of Manchester. The cost at Kimbolton is clearly stated by Mr. Wallis. I may, however, say that Mr. Wallis states that the picking and planting of three roods, according to the new plan, occupied one man and four women one day. Three horses were engaged in the work for one day to score the ground, cut and cart the turf, &c., but he says they could do "one acre of such work in a day easily." It should, however, be stated, that the expense of haulage at Kimbolton was but little, as the strips of turf were obtained close by in an adjoining field.

I think it is evident from the foregoing that the improved system of inoculation practised by the Duke of Manchester is the most economical method known, and that he deserves great credit for its introduction. But there are a few points besides the labour-bill that require some consideration.

Mr. Wallis very correctly states that the "portion planted with 4-inch pieces had a rather rough and uneven appearance." And so it has. The 2-inch pieces have also produced a sward of a somewhat uneven appearance, but very much less so than the 4-inch pieces. At the same time it must be admitted that the land planted with small pieces has been laid down more recently than that which was inoculated with the larger sized pieces of turf, and has not had the advantage of time which smooths down or raises up to a level the little inequalities of surface which follow inoculation. The preference, therefore, on this ground must decidedly be given to the system of inoculating with small pieces. It may be suggested whether it would not be advisable to cut ropes of still smaller dimensions. There would certainly be an increased cost for labour in planting the additional number of pieces. The suggestion, however, having been made, a useful experiment would be such as would determine the minimum size of turf ropes to be cut, in depth as well as breadth, and the relationship between a greater subdivision of the turf and the labour of planting, the general success and the economy of the operation. So far as I can see, the Duke of

Manchester has arrived at that minimum point. But it is better to accept nothing as final without direct experiment.

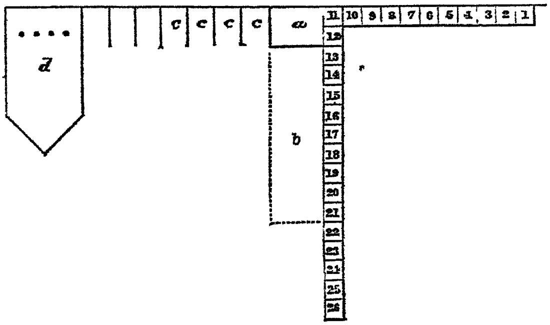
We have so far only spoken of the land inoculated, nothing of the pasture from which it is made. Woburn Park got so disfigured under the old process, that George Sinclair, gardener to the Duke of Bedford, in the work already mentioned, says, that the marked stripes remaining after it had been robbed of a portion of its turf so inconvenienced people in walking and riding, that the vacant spaces "had to be filled up with mould and sown with grass seeds, for there were no creeping rooted grasses present." By cutting out only two 2-inch strips at some distance apart, no such predicament follows. At Kimbolton the implement goes down the land, generally along the furrow, leaving the whole back of the ridge untouched; excoriations heal up rapidly, so that, although the indentation made is distinguishable, no perceptible damage remains after the first year, as far as the eye can judge.

The opinion of Mr. James Howard, with regard to inoculation is, that it is an "expensive method." This clearly means that it costs too much, but he says "a good pasture is much more quickly obtained." There can, I think, be little doubt that inoculation has one great advantage over sowing seeds, namely, that there is no falling off experienced in the third, fourth, or fifth year, at least to the same extent as is universally admitted occurs when land is laid down to pasture with artificial grasses. Once inoculation "takes," the grass goes on improving. It certainly does not appear to get worse, if we accept the unanimous testimony of those who have practised the system. If it be granted, therefore, that a good pasture is formed more quickly by transplanting turves than by sowing seeds, and that inoculation produces pasture that does not deteriorate in quality as when artificial grasses are sown, a great deal has been said in its favour. The only other important consideration is one of cost, which will greatly vary according to circumstances, such as the price of labour, and the distance from which the strips of turf have to be procured. Finally, it appears to me that the least expensive and altogether the best method of inoculation is that which has been practised at Kimbolton Park Farm by his Grace the Duke of Manchester.

VIII.—*Note on an Outbreak of Foot-and-Mouth Disease.* By W. J. EDMONDS, of Southrop House, Lechlade.

[In a Letter to the Editor.]

IT may not be uninteresting at a time when "Foot-and-Mouth" disease has been recently so prevalent, to furnish you with the result of an experiment I unintentionally made on some fattening cattle. Knowing that the disease had come within two miles of us (it had, in fact, attacked animals very near, of which I was not aware), I ordered a cow, which was nearly fat and near home, to be put into the feeding-pits in which were 14 oxen and heifers. The pits form two sides of a rectangular parallelogram, Nos. 1 to 26; whilst on one side of them are open stalls (*b*), tie-up places (*c*), and a yard (*d*). These were also filled with cattle, and the whole were attended to by one man, whose feeding-house is (*a*). The cow was put into No. 18, September 17th; on the morning of the 18th my bailiff told me, that although they detected no disease on the 17th, yet they had that morning found that she was suffering from foot-and-mouth disease, and had put her in the meadow she came from. MacDougall's powder was freely used over the whole place, and the manure from the affected pit removed. I immediately ordered some carbolic acid to be procured, and we sprinkled some mixed with water in the different buildings; rubbed the faces of the animals with acid and oil, and for some time washed the rails every day with diluted acid (which the cattle often licked off), sprinkling the pathway as well. Eight of the oxen were in Nos. 1, 2, &c.; the other six occupying Nos. 20, 21, 22, 23, 24, 25. On the 22nd of September, the ox in No. 23 was attacked with foot-and-mouth disease, and although it refused



food, excepting pollards and a little hay, for two or three days, it soon recovered, so that the attack was evidently slight. On the 26th, No. 24, which drank from the same trough, was observed to have that peculiar smacking of the mouth which is a sure sign of this disease; but that suffered less from it than did the first. On the 28th, No. 25 had a yet slighter attack; and no more were taken ill until the beginning of October, when No. 21 had a similar attack to the first; whilst about the same time a young bull in one of the pens (*c*) was affected.

The disease has spread no further on those premises. The same person attended to all the cattle, who took the precaution of both feeding and littering the healthy ones first. The result of the attack appears to me to have a value, as tending to show that the poison-germs of foot-and-mouth disease float in the air, and communicate disease, as does also the actual contact with saliva, &c. Else how was it that the ox in No. 23 took it from the cow? Again, after Nos. 23, 24, 25, had had it, it passed over Nos. 21 and 22, and attacked No. 20. Certainly the man may have conveyed it to them, as I suspect he did to the young bull.

This experiment also tends to confirm the opinion that carbolic acid is most valuable as a preventive, and that it also exercises a beneficial influence on animals attacked. I think, too, it points to the necessity of shutting affected cattle into yards upon the first appearance of the attack in them; in fact, isolate the disease by confining them to a *fever hospital.* If they are left in a field, every living creature passing through it may carry the disease on to other fields, till, like a fire, gathering strength as it goes, a whole district is attacked, and no precautions can avail to stop it. So has it been with us this year on all our grazing and dairy land; and the loss has been very great. At a place called Inglesham, I rode, at the time, through a dairy of 30 milking-cows; and whilst some were in a deplorable state, all looked more or less wretched; and I am quite sure that 3*l.* a-head is a moderate estimate of the loss sustained. This was not a solitary instance, but a *sample* of the whole neighbourhood; whilst only last week a cattle-dealer of repute told me that a great many graziers would not be able to bring out their cattle at Christmas as they had intended, on account of the loss of condition, through foot-and-mouth disease.

December 4th, 1875.

IX.—*Researches into the Nature of the Potato-fungus*—Phytophthora infestans. By Professor A. de BARY, of the University of Strasbourg.

INTRODUCTION.

PREVIOUS to my undertaking, at the request of the Royal Agricultural Society, the task of endeavouring to extend our knowledge of the life-history of the potato-fungus, I had devoted a long series of researches to this subject. Although I assume that those researches, so far as they have been published, are known—and, in fact, I must do so for the sake of avoiding too great minuteness of detail—yet a short *résumé* appears indispensable; and I will give it by way of introduction, referring, at the same time, to the existing literature of the subject.*

1. The potato-fungus is usually classed with a small family of parasitic fungi, which since 1863 has been known as the *Peronosporeæ.*

Taking first the purely morphological peculiarities of these fungi, without regard to their immediate adaptation to the medium in which they grow, we find in the first place that the growing plant (*thallus*, *mycelium*) consists of densely ramified tubes; these are full of protoplasm and continuous, or without septa, except that some individuals, especially when they are old, have irregular septa. Some small branches of the mycelium are specially developed as organs for attachment and as suckers; others produce the organs of reproduction. One set of these last bear non-sexual cells (*conidia*), and are therefore called "conidia-bearing" (*conidiophores*); others, which mark the complete development, form at their tips the sexual organs: these are (first) the bladder-shaped female cells (*oogonia*), from the protoplasm of which a thick-walled *oospore* is produced, after fertilisation by (second) the small male cells (the *antheridia*). From the germinating oospore springs directly or indirectly one or more new rudimentary mycelium threads ("germ-tubes"), with which the process of development just sketched begins afresh. I have here employed for the sexual organs and the structures developed from them the terms which at present are most in use, and will continue to do so in the following pages, though other terms might be employed which are more correct. The use and explanation of these, however, would lead me beyond my present purpose.

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* Recherches sur le développement de quelques champignons parasites.' *Ann. Sc. Nat.* 4^{me} série, t. xx. 'Die gegenwärtig herrschende Kartoffelkrankeit. Leipzig, 1861. 'Zur Kenntniss der Peronosporen,' *De Bary and Woronin, Beitr. z. Morphol, &c. d. Pilze*, Heft 2, p. 35.

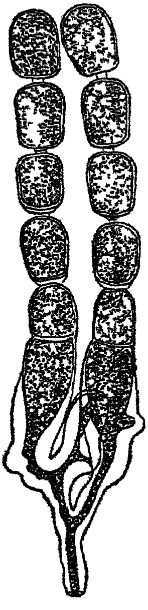
The known forms of mycelium present great similarity of structure, notwithstanding some peculiarities which supply valuable characteristics for distinguishing species.

The characters derived from the structure and growth of the conidiophores divide the *Peronosporeæ* generally into two, perhaps better into three, genera, *Cystopus*, *Peronospora*, and a third, which may be called *Phytophthora*.

The conidiophores of *Cystopus*, the fungus of the "white rust" of plants, are short, club-shaped, terminal branches of the mycelium, which bear on their expanded apex a single row of conidia, developed in basipetal order. The conidiophores grow in large bunches (see Fig. 1). In *Peronospora* (see Fig. 2) the conidiophores occur singly, or in small bunches, and are tree-like or dichotomously branching tubes. On the sharp end of each one of these branches a solitary conidium is formed, and this is never followed by a second.

Phytophthora (see Fig. 3) is distinguished from *Peronospora* in having not one but several conidia successively formed at the end of each branch of the tree-like conidiophore. When the first conidium is ripe, it is pushed to the side by an unequal swelling of the point to which it is attached. The top of this swollen portion then begins to grow in the original direction of the branch into a new conical point; and when this has reached a length equal to that of a conidium, or a conidium and a half, a new conidium is produced at its apex. The same process may be repeated in vigorous specimens from 10 to 15 times. After the falling of the very easily shed conidia, as many swellings remain on each branch of the conidiophore as there had been conidia; such swellings do not occur in the stems of the true *Peronospora*, but are a sure empirical character of the *Phytophthora*. Among the well-known forms of the family, the potato-fungus, *Peronospora infestans*, Mont., is the only one which has this peculiarity. It may therefore be distinguished as *Phytophthora infestans*.

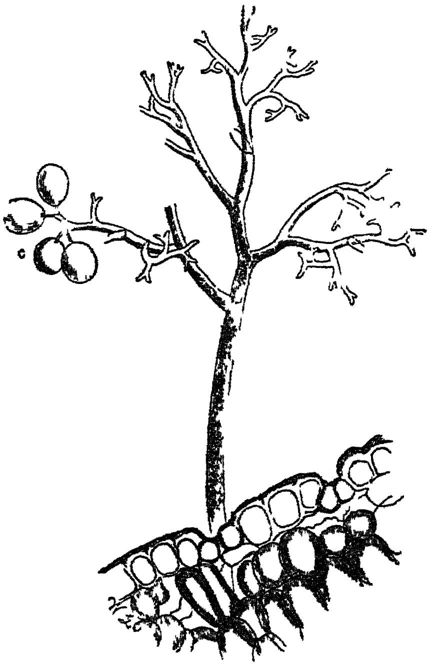
Fig. 1.



Branch of the mycelium of *Cystopus portulacæ*, Lév, with conidiophores. Magn. 390 diam.

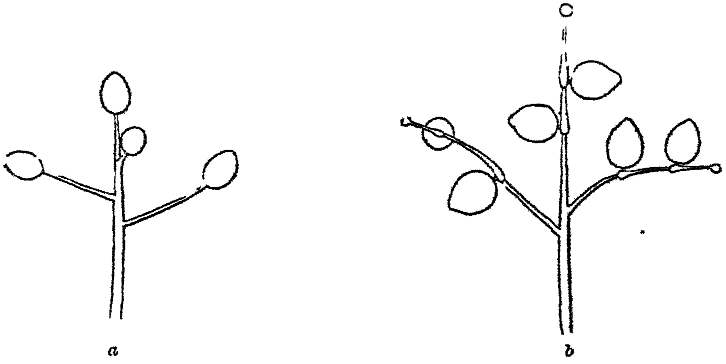
The further development of the mature conidia is the same in *Cystopus*, *Phytophthora*, and many species of *Peronospora* (see Fig. 4). If fresh ripe conidia are placed in water, their protoplasm, separated into 3 to 8 or more portions, issues through the swelling gelatinous membrane of the tops of the conidia and

Fig. 2.—*Conidiophore of Personospora arborescens*, Berk.



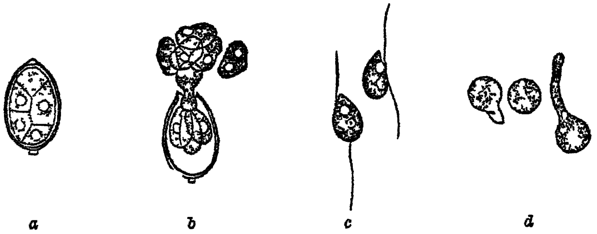
Conidiophore growing out of the stomate of the stem of *Papaver somniferum*, Linn. *c* Four conidia still attached to the ends of the branch. Magn. 200 diam.

Fig. 3.—*Conidiophores of Phytophthora infestans.*



a Formation of the first series of conidia at the tips of the branches. *b* First stage of the growth of the third series of conidia, the first and second series have been pushed to one side, but are still attached to the swollen parts of the branch. Magn. 200 diam.

Fig. 4.—*Phytophthora infestans.*



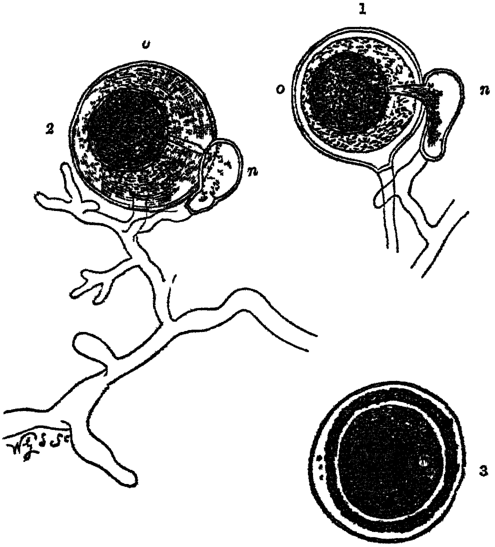
a. Conidium, in water, with the protoplasm divided to form the zoospores *b.* The zoospores escaping from the apex of the conidium. *c* The zoospores in motion *d.* The zoospores which have ceased to move, and are beginning to germinate. Magn. 390 diam.

move freely in the water, like so many swarmspores (*zoospores*). After a short time these come to rest, and, on a suitable medium, each develops a new mycelium. From the facts just mentioned, these conidia may be called zoospore-forming cells, or *zoosporangia*, a name which is employed for similar organs observed in other water fungi and algæ. The zoosporangia of all these plants, when disturbed or prevented by any cause from forming zoospores, grow at once into a new plant (thallus or mycelium); and this also often happens in *Peronospora* and *Phytophthora*.

In most species of *Peronospora* (those called *acroblastæ*, and *pleuroblastæ*) this phenomenon is the rule without exception. Zoospores are never formed, but each conidium grows into a single mycelium tube. A small number of species (*Peronosporæ plasmatoparæ*) are intermediate between the two just mentioned, but they do not require to be here described.

The sexual organs and oospores of all the species of *Cystopus* and *Peronospora* have essentially the same structure, the characteristic differences which they possess being of *specific*, not of *generic* value. The oogonium is a globular cell, completely filled with protoplasm, generally the end of a mycelium branch, rarely in the middle. Contemporaneously with the oogonium, or only a little later, the antheridium belonging to it is developed in the end of another mycelium branch, which has already attached itself firmly to the young oogonium. The antheridium is a much smaller cell than the oogonium, and is mostly oval, or club-shaped. Both organs grow together, closely united, until they reach their full size, and then follows the fertilisation of the oogonium and the formation of the oospore. In the oogonium a thick globular mass of protoplasm, particularly fatty, separates itself from the rest. It occupies the central and larger part of the cavity; the periphery is filled with the less compact mass of protoplasm. After the separation of the protoplasm, the antheridium sends out, from the surface applied to the oogonium, a small beak-shaped projection, which pierces through the walls of the oogonium towards the central mass of protoplasm. As soon as this projection touches the surface of the globular mass it ceases to grow, and a cellular membrane surrounds the surface

Fig. 5.—*Sexual organs of Peronospora.*



1 and 2 *Peronospora Alsinearum*, Caspary, on *Stellaria media*, Smith *o* Oogonia; *n* antheridia shortly after fertilisation A considerable portion of the mycelium is shown in Fig 2
3 *Peronospora grisea*, Unger Oogonium and oospore not quite mature, median (optical) section All magnified about 390 diam

of the globule. This membrane increases in thickness, and becomes the inner membrane of the oospore (endosporium), while at the same time there is formed on its outer surface, from the peripheral or surrounding protoplasm, the outer membrane (episporium), which is mostly of a very dull colour, often dark. The oospore grows in this way from the globule in the oogonium. The walls of the oogonium and the antheridium may either assist the mature oospore or wither.

The mode of germination of the ripe oospore is known in *Cystopus candidus*, and in some species of the *Peronosporæ pleuroblastæ* (*P. Valerianellæ*, *P. Alsinearum*). In *Cystopus* the oospore produces numerous zoospores; and as regards the formation and further development of these all that has been already said respecting zoospores holds good. In the species of *Peronospora* just mentioned, each germinating oospore sends out a mycelium tube, like that of the conidium belonging to it. It is, therefore, quite probable that the species of *Peronospora* which like

Cystopus, produce zoospores from their conidia, present also the same phenomenon in connection with the oospores.

Up to this time the sexual organs have not been observed in *Phytophthora*, the potato-fungus. What is known of it in other respects corresponds so well with *Peronospora*, that there is doubtless every reason to expect exactly the same sexual organs in the one as in the other. Still this is not certain; and, in particular, stress must be laid on the fact that there is another group of fungi to which, as far as our knowledge goes, the potato-fungus might with equal reason be compared; I refer to the family of *Saprolegnieæ*, fungi which for the most part live in water; some grow in living plants. Their mycelium and the mode of formation of their zoospores essentially agree with what is observed in *Peronospora*, but the form of the zoosporangia is often different, though not always. The principal difference of the two families consists in the mode of formation of the oospores, for in *Saprolegnieæ* the entire protoplasm of the oogonium goes to form the oospores,—forming either *one* by separating itself entirely from the oogonium and surrounding itself with the endospore and epispore, or forming *several* by separating into a number of parts, each of which possesses the structure of an oospore. The shape of all these organs is always very like that of the same organs in *Peronosporeæ*, and the method of germination in the oospores is also similar; but the oospores themselves are usually smaller and more slender. Should, therefore, *Phytophthora* come to be classed with the *Saprolegnieæ*, the mode of formation of the oospores would be expected to be similar to what is known to take place among its allies, just as when it is placed, as it usually is, with the *Peronosporeæ*, we ascribe to it the same method of reproduction as we find in that family.

2. The phenomena connected with the growth of the *Peronosporeæ* are tolerably uniform; all are typical parasites in living plants containing chlorophyll. Their complete development is dependent on their finding the living organism, with its chemical and physical properties, which will afford it a suitable host; and most species are so restricted in this respect that they can only grow in certain species or groups of species of plants but not in others, a condition of things which holds good for parasites generally. But this does not exclude the possibility of bringing a parasite more or less forward in its development by means of artificial nutriment.

That the species of the *Peronosporeæ*, as parasites, do more or less interfere with the life of their host and produce disease in it must be obvious; and the circumstances under which this occurs is too generally known to require detailed explanation here.

The mycelium of the *Peronosporeæ* grows in the living tissue of its host, and with the greatest vigour when the foliage and flowers are being rapidly produced in the summer; this to some extent determines the principal season of the growth of these fungi. At the same time, it should be remembered, that the mycelium of particular kinds may in the case of perennial plants also continue to live in and along with the perennial parts, and annually to spread from them to the parts developed in summer, and so extend itself along with these, as, for instance, *Peronospora Ficariæ* in *Ranunculus Ficaria*, *P. Rumicis* in the sorel, *Rumex acetosa*.

The tubers of the mycelium grow chiefly between the cells of the tissues of the host-plant, not only touching the cells, but in most species also pushing their small branches, which I have before called suckers, into the interior of the cells.

In certain species, which do not concern us here, the conidiophores are formed only on very special regions of the host; in most species they may grow wherever there is mycelium. They are produced when the mycelium passes out from the tissues of the plant into the air, that is, with rare and casual exceptions, upon the surface of the plant, particularly the foliage. In *Cystopus* they form thick layers under the epidermis, which they burst open by the increasing accumulation of conidia. In *Peronospora* and *Phytophthora* they penetrate the epidermis into the air either singly or in small bunches, mostly through the stomata; in parts where these are absent they pierce through the cells of the epidermis. The mature conidia fall from their pedicels, and being light bodies are readily carried away by currents of air or by minute animals. As soon as conidia are mature they are ready to germinate, and do indeed germinate when surrounded with moisture, and form zoospores when they are placed in water. The germinating spores, when they find a suitable host, at once penetrate the epidermis into the interior of the plant, and grow into new mycelium, which soon again pushes into the air. and forms more conidia. A short time and a small quantity of water are all that is needed for the germinating of these spores and their penetrating the host plant. A single damp night, or a short shower, furnishes the necessary conditions. After a few days the new mycelium sends out its first conidia, and these continue to be followed by others for weeks. These phenomena explain why it is that the fungus in question is able to spread itself in summer rapidly over large districts and attack many plants. The conidia are the organs of this propagation. They do not retain their vitality and power of growth for more than a few weeks at most. That they remain alive through the winter has in no case been observed.

The oospores of *Cystopus* and *Peronospora* are formed in the interior of the tissue of the host, mostly between the cells, rarely in the interior of the cells, as, for instance, in *Peronospora Sempervivi*, discovered by Professor Schenk. They have their origin either in the same part of the host where the conidia occur, or their formation is limited to a particular spot. The species of *Peronospora* which inhabit different kinds of host-plants are found on all of them, or at least on several of them, with conidia as well as with oospores, *e.g.* *P. Alsinearum* on species of *Stellaria* and *Cerastium*, *P. Ficariæ* on several species of *Ranunculus;* or they form conidia on all hosts, but oospores only on certain hosts, *e.g.* *Cystopus cubicus.* When, therefore, a species of *Peronospora* is always found in a phanerogamic plant with conidia only and without oospores, it is fair to conjecture that the fungus inhabits a host plant of another species, in which the oospores must be sought. This conjecture must be based, not on a single instance, but on extended and long observation, for both the presence and the absence of oospores may be due to other causes, such as climate and season. I find *P. Alsinearum* in the country here on *Stellaria media* always with oospores and conidia in spring, while in autumn often with conidia, but never with oospores. In *Cystopus candidus*, the well-known rust-fungus of the *Cruciferæ*, the oospores occur very seldom in North Germany, so far as my experience goes, but are common in South-west Germany in many species of host plants. We have not then absolute laws to deal with here, but laws which in special instances admit of exceptions. For example, *Cystopus cubicus* occurs very often on species of *Tragopogon*, *Podospermum*, and *Scorzonera.* I have found it almost always with conidia and oospores on *Sc. hispanica*, but for years as regularly without oospores on all other hosts. In one case, however, I found the oospores on the leaves of *Tragopogon porrifolius.*

When the oospores are mature, the part of the host which contains them soon dies. It then withers and falls to the ground; the dead tissues, and often also the membrane of the oogonia, decay, and the oospores alone survive. In places where they exist in great numbers, they can be detected in the ground. A considerable period of apparent inactivity precedes their germination, which does not, in the cases hitherto observed, take place till after the winter has passed, no matter whether the maturity had been arrived at in autumn or, as is mostly the case, in early summer. The germination of the oospore and the penetration of the young fungus into the host plant occur in the moist and warm season which succeeds the winter; the renewal of summer vegetation is taken for granted. The oospores therefore act as the organs of hibernation in the life of *Peronosporeæ;* and for the species which grow only during the summer, the oospores are the only means for carrying them through the winter; others may, as has been shown above, hibernate by means of perennial mycelium.

All the foregoing statements have been confirmed by direct observation made in special cases. In no particular do they rest on mere conjecture. It will be apparent then that, as regards the whole life-history of the *Peronosporeæ*, there exists a general plan, which, however, presents numerous variations in detail according to the species. This must be kept clearly in mind in the investigation of every case which occurs in practice, so that while we follow the general well-established rule, we must, nevertheless, not expect identical phenomena in all cases.

Of the *Saprolegnieæ*, which must be considered in connection with the question before us, only a few species of *Pythium* are parasitical. Most of the species live in dead organic bodies. What we know of the species parasitical on living plants corresponds with the known phenomena of the *Peronosporeæ*, to such an extent, at any rate, that it is unnecessary to describe them here minutely. One fact only is important, viz. that the oospores of the *Saprolegnieæ* often live through the winter, or, at least, *are able* to remain a considerable time in apparent inactivity; while, on the other hand, it has been observed that they are capable of germinating within a few weeks, or even a few days, from the time they attain maturity. From this it is evident that oospores, even of closely related forms, do not always pass through the same series of changes; and, since the oospores of some species of *Peronospora* present great similarity of structure to those of *Saprolegnieæ*, it may be regarded as possible that such species would exhibit the same phenomena in their history.

There is yet another circumstance which must here be referred to. There are parasites which cannot complete their entire development in *one* host-plant, but require *two* different species of hosts; in the one they complete a distinct stage of their development; in the other, the second stage, and then return to the first host to begin again. This necessary change of the host is called *heterœcia* or *metœcia.* We have familiar examples of this among animals in the tapeworms, and among fungi in many of the rusts. It should be remarked here that metœcia has not been observed, and is not even likely, to occur in any *Peronosporea* or *Saprolegniea;* all the species belonging to these families, which have been thoroughly investigated, are known to have only a single host on which they complete without change their entire development,—they require no second one. Sometimes the species parasitical on one host plant attaches itself to another host, but only partially carries out its development in it, say as far as the formation of conidia; but it should be noted that this is a phenomenon altogether different from that of metœcia.

LIFE-HISTORY OF THE POTATO-FUNGUS.

3. Let me now try to explain from known facts and from the observations that have just been made, what is known of the life history of the potato-fungus, and what yet remains to be discovered. In the first place, it is generally known that when the potato-fungus has once made its appearance in the fields in summer, its progress, so far as concerns the formation, mode of distribution, and germination, of the conidia, are the same as that described above in connection with the *Peronosporeæ*. It is further known that the conidian growth is not only found in the foliage but that it extends to the tubers in the ground, and there develops the mycelium, which is the immediate cause of that injury to the tubers which is so dreaded. On the decay of the foliage, and when the tubers have been gathered, the fungus disappears from the field, and does not appear again till next summer; generally not when the young foliage appears, but about the time of the blossoming of the potato, or even later. The question then arises, Where does it remain in the period between its disappearance and its re-appearance? How and where does it winter, and how does it pass from its winter-quarters to the foliage of the potato?

In the first place, it is clearly established that the conidia of the potato-fungus have a very short existence, and are incapable of living through the winter. From what is certainly known about all other *Peronosporeæ* and also about *Saprolegnieæ*, we can look only to oospores, which endure throughout winter, and to perennial mycelium for maintaining the life of the fungus. It has long been known that perennial mycelium frequently occurs in the tubers, and to this point I shall again recur. Oospores have not been observed in the *Phytophthora*; but from analogy, it may be taken as certain that they may somewhere occur. The discovery of them would at once fill up the gap, both in the morphology of the fungus and in the practically important question of how it hibernates. And, accordingly, ever since the oospores of a *Peronospora* were discovered, innumerable searches have been made for those of *Phytophthora*. I have myself looked for them for fifteen years, and on every opportunity have searched for them in the stalks, leaves, flowers, fruit, and tubers of the potato. In July of the present year

(1875), when the fungus appeared in this district in sad abundance, I obtained a very large amount of material for study, and at the same time secured the kindly assistance of two botanists experienced in researches of this kind, Dr. Rostafinski and Dr. Stahl. But again only negative results were arrived at.

4. From the researches on the tubers it seemed possible that by other methods the oospores in the potato might be discovered. It is known that in tubers which are well-ripened and comparatively free from water, the mycelium is capable of living and vegetating for a long time, even until well into the following summer. If we cut such tubers and place them in a moist atmosphere, the fungus grows luxuriantly from the cut surface, and forms stronger conidiophores than anywhere else. In a moist atmosphere the fungus will send out conidiophores through the skin; and Kühn * has called attention to the fact that this phenomenon occurs in cellars without artificial encouragement. Since then known facts do not exclude the possibility of *Phytophthora* being a *Saprolegniea*, or, at any rate, being closely allied to *Saprolegnieæ*, and since most fungi of this family grow in water, while even the few species which are parasitic on land plants, fructify most abundantly under water, the question arises whether this may not also hold good of the potato-fungus, particularly as regards the formation of oospores. Accordingly, tubers with abundance of mycelium were repeatedly placed in spring-water. The invariable result was that numerous branches from the mycelium grew in the water. These had the same peculiarities as branches sent out in the moist air; some even assumed the character of conidiophores, forming at the extremity conidia, which, without falling off, produced zoospores, resembling in this respect the sporangium of *Saprolegnieæ*. But each time this entire water-vegetation of the *Phytophthora* quickly perished with the corruption of the potato, and not the slightest trace of oogonia was found. The same experiment was repeatedly made with stalks and leaves, which were filled with the fungus, but always without any positive result, because a plant which the fungus has attacked at once becomes rotten in water, and the *Phytophthora* dies as soon as the surrounding tissues are rotten.

The experiment was then so far changed by placing the same substances in moist earth instead of in water. From the tubers grew up the usual conidiophores; but here also the stems and leaves quickly became rotten, and the fungus with its oogonia nowhere occurred. Other forms of fungi, not belonging to *Phytophthora*, were, it need not be said, very often found.

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* Zeitschrift des landwirthschaftlichen Central-Vereins d. Provinz Sachsen, 1870, No. 12.

5. After these successive failures, there still remained a possible method of discovering the oospores, suggested by another phenomenon observed in the tubers. It is known that potatoes which are injured and infested with *Phytophthora* are capable of sprouting, like healthy specimens, and even producing entirely healthy shoots and plants. While examining diseased tubers of this kind which had sprouted, I had often, after they were shrivelled, found, in the tissue which contained the *Phytophthora*, bodies which, it might be supposed, were oospores of a *Peronosporea* or a *Saprolegniea.* On the other hand, I had observed in several previous experiments with diseased tubers a condition of the mycelium which seemed to promise a positive result. It is known that the starch contained in the healthy colourless tissues of the sprouting tuber is gradually reduced in quantity, and that the large cells become filled with watery liquid. Owing to this the whole structure becomes watery-transparent: it remains at first turgid and firm, then afterwards it collapses and decay takes place. In the diseased tubers this phenomenon occurs in the tissues which have remained healthy, and which are principally found in the centre of the tuber, while the fungus generally keeps to the periphery or exterior portion, where it discolours and kills the cells. During the sprouting of the tuber we can see the fungus shooting from the discoloured portion into the watery and healthy centre, where it grows very luxuriantly. It sends out many branches between the cells of the tuber, and also forces short branches into the interior of the cells; it is vigorous, filled with colourless protoplasm, and gives an impression of most exuberant growth. No discoloration of the watery-tissues, it should be said, takes place. These phenomena suggested the possibility that the luxuriant branching of the fungus in the sprouting potato was for the purpose of forming the oospores. On this hypothesis hinged another; viz.: that the supposed formation of oospores must be completed, and the oospores matured, simultaneously with the shrivelling up of the seed-tubers. This would, moreover, be about the time of the full development of the potato plant, when the fungus usually appears in large quantities. Now, it is not absolutely necessary that oospores should pass a winter before germination; the germination, as has been stated above in regard to *Saprolegnieæ*, may take place speedily after they arrive at maturity; and in the *Peronosporeæ*, it may at least be looked upon as a possible phenomenon, depending upon surrounding circumstances. Thus arose the conjectures that perhaps the oospores of the potato-fungus originated from the mycelium growing in the sprouting tuber; that the oospores germinate immediately, after they reach maturity, which is contemporaneous with the full

development of the foliage; and that their germs at once attack the foliage. The difficulty in the way of accepting this theory, namely, that the tuber is under while the foliage is above the ground, is easily set aside when we remember that the sprouting tuber is almost always sought after by minute animals—*Acarus*, *Julus*, and *Lumbricus*—by whose agency the oospores could readily be brought to the surface of the soil.

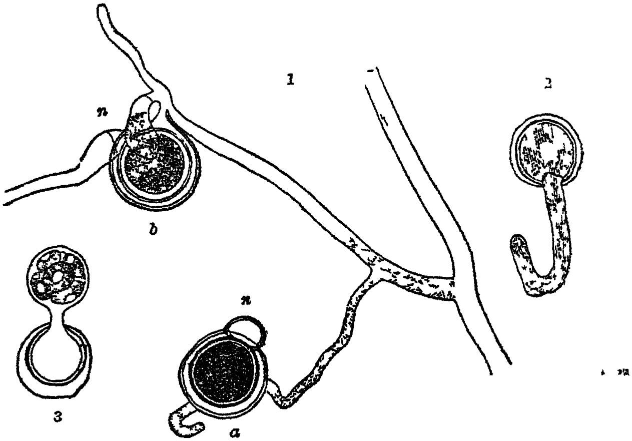
I must begin by saying that the researches made for the purpose of testing these theories have also been followed by *purely negative results.* Still it will not be useless if I describe briefly the various steps of the experiments.

At the end of February and beginning of March a considerable number of potatoes, up to then healthy, were artificially inoculated, varieties being selected which were known to have remained a long time watery-turgescent after sprouting. The inoculation took place in this way: fresh conidia, capable of germinating, were placed on the terminal eyes of the tuber; the infected spot was then covered with a piece of wet blotting-paper, and the tubers were placed in a moist atmosphere (under a glass bell), out of which they were not taken for several days. By this process infection can be obtained with great certainty; the existence of the fungus is, after some time, clearly visible externally by the browning of the eyes and the sinking of the surrounding parts. In continuing the experiment, only those tubers were made use of in which infection had actually taken place—about sixty in number,—and the microscopic examination which followed invariably disclosed the presence of the fungus in their interior. At the end of March and beginning of April they were planted partly in flower-pots and partly in the open ground. From the eyes, which remained healthy, they sent out many shoots, mostly healthy, but also some affected by the fungus, which will afterwards be described. They were examined one by one, according to their different stages, the last on the 5th of July, with the result that the phenomena already described presented themselves successively in the interior. Oospores were not found. Other fungi, not belonging to *Phytophthora*, were often found growing abundantly in the collapsing watery-tissues; animals of the kinds already mentioned and infusoria were also observed.

6. A great abundance of fungi was developed in the tissues of the outer portion of the potato, which are known to resist decay very long, but which were discoloured by *Phytophthora.* The fungi were developed while the tubers were still in the ground. These fungi were chiefly of the kinds that have long been known to attack sickly tubers, such as *Fusisporium* and *Spicaria;* it has also been long known that these have no

morphological relation to *Phytophthora.* But in several tubers which had sprouted in the ground, and were very much collapsed in the interior, there was found, not only in the experiments made in 1874, but also this summer, in the discoloured tissues containing *Phytophthora,* a form of fungus, the first sight of which showed that it must be either a *Peronosporea* or *Saprolegniea,* with oogonia, antheridia, and oospores (see Fig. 6.)

Fig. 6.—*Pythium vexans,* De Bary.



1 A mycelium tube with two oogonia (*a* and *b*) almost mature, with antheridia, *n* In *a* the attachments of the oogonium and antheridium are not seen, being behind, in *b*, the insertion is somewhat oblique Magn 600 diam 2 Germinating oospore sending out mycelium 3 The same forming zoospores 2 and 3 a little less magnified than 1

The suspicion readily suggested itself that the organs of *Phytophthora* which had been so long looked for were at last found. However, in this case a closer examination showed that this was a mistake. It will, however, be instructive for my purpose to enter here into some details. The presumed oospore-bearing fungus was found, as has been said, in the tissues discoloured by *Phytophthora,* and that, too, in the *interior* of the cells. Its oogonia, in various stages of maturity, were supported in a characteristic manner (which I shall more fully describe hereafter), on cylindrical threads without septa, completely resembling in structure those of *Phytophthora.* though, it is true, distinguished by a different distribution of protoplasm, and by being much thinner than the usual *Phytophthora* mycelium. It became, however, abundantly clear that these thin threads were branches of other mycelium, which corresponded in thickness with the mycelium of *Phytophthora,* and like it, buried themselves among the cells of the potato in the intercellular passages. It was scarcely possible, especially in the discoloured tissues, to draw a positive distinction between the two kinds of intercellular filaments.

The oogonia (1, *a*, *b*) are round cells. Their position on the mycelium is either sessile on its outside, or they are inserted with a broad base into the mycelium-tube. In contact with the oogonium lies an antheridium—rarely two—which, as a rule, is club-shaped, and rises close to the oogonium from the same tube (1, *n*). Unimportant exceptions to this rule may here be passed over. A single oospore is formed from the whole of the protoplasm of the oogonium. It occupies the cavity, is nearly globular, and at the period of maturity has the usual oospore structure described above, with very thin, smooth episporium, which when mature is of a light yellowish-brown colour, like the persistent wall of the oogonium. In the proper place, and at the very time when they were sought for, there were, then, found oospores which might have belonged to *Phytophthora infestans*, not only from their structure, but also because they *seemed* to spring from thin branches of the intercellular mycelium of that fungus. They differed from all similar organisms which I knew, in their small size, and in the peculiar insertion of the oogonium and antheridium. To test the value of the conjecture that these were the oospores of *Phytophthora*, an attempt was made to obtain their speedy germination. To observe this, thin slices from one of the potatoes in which they were particularly plentiful, but in which other fungi and infusoria were relatively scarce, were placed in drops of water on object-glasses, and the oöspores were further isolated. Some of the oospores sown in this way germinated, sending out, within twenty-four hours, a tube, which became several times longer than the diameter of the oogonium (Fig. 6, ^{2}); in the course of one to two days some of these tubes also sent out several short branches, and then they ceased to grow. Previous to this, the extremity of the tube or of a branch often swelled into a round bladder, into which all the protoplasm was collected, and which was then cut off by a septum. The young plant did not grow further. When the potatoes which were experimented on had been kept a few days longer in a moist atmosphere, so as to prevent their drying up, and secure the complete maturity of the oospores, new sowings were made. In this case the result was different. Some of the oospores did not germinate; but a large number of others speedily sent out a thick, short, straight tube, which grew to about the length of the diameter of the oospore, and then its further growth lengthwise ceased; but soon its extremity suddenly swelled out into a globular bladder. Into this, while it was swelling out, streamed all the protoplasm of the oospore, formed itself into a ball, and then quickly divided itself, generally into from six to eight portions (the number is variable), which, like so many *zoospores*, rapidly quitted the dissolving gelatinous bladder (Fig. 6, ^{3}). These zoospores resemble those of species of *Peronospora* and *Pythium*, and of *Phytophthora* in form, structure, and movement (differing, perhaps, from the latter to a small extent in size, but this was not precisely determined). Like these they move about a short time in the water, after which they become quiet and germinate. Their first tubes ("germ-tubes") remained short and without branching, even for several days, in the cultivated specimens which have been described. In two hours after sowing, the first zoospores were found, mostly in the drops of water. Their number was usually much increased in the hours immediately following.

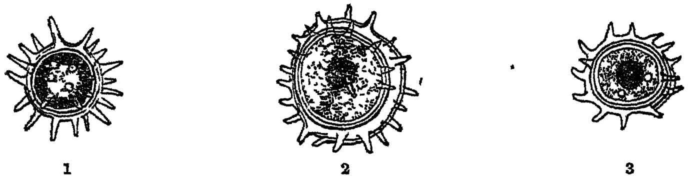
Thus were developed young plants ("germ-tubes") and zoospores which completely resembled those of the potato-fungus. Only one thing was wanting; but that was, without doubt, the chief thing, viz., the proof that what was found really belonged to *Phytophthora*, and not to some other fungus resembling it and accompanying it. The proof here required could only be obtained by ascertaining if the young plants ("germ-tubes") and zoospores would grow on a suitable nidus or substratum into undoubted *Phytophthora*. There was no need for uncertainty in determining this, since sufficient quantities of the zoospores or germinating bodies of the oospores could be had, and since the conditions attending the development of *Phytophthora* from its spores were known. Accordingly I made numerous sowings of the oospores in drops of water on fresh leaves, stalks, and tubers of the potato. The formation of the zoospores was easily confirmed in these sowings. But nowhere did the young plants ("germ-tubes") advance beyond the stage of development which they reached on the glass, nowhere did they penetrate into the interior of the living parts of the plants, and nowhere did they develop mycelium. This result, repeatedly confirmed with certainty, could mean nothing else than that these oospores did *not* belong to *Phytophthora*, but to another fungus, which apparently had entered into the already dead tissues of the tuber while it was still in the ground. The facts observed regarding this fungus corresponded best with the genus *Pythium;* and since it did not take possession of the living potato-plant, it was to be expected that, like most of the members of this genus, it would find its suitable nidus or substratum in dead organic bodies. From experience acquired in connection with other species of *Pythium*, I now made sowings on dead animals, by placing small fragments—as the legs of flies and newly-killed mites—on glasses, in drops of water in which the zoospores of the fungus were abundant. In this manner I might be able to observe step by step the whole of the further development The zoospores at once attached themselves in great numbers to these fragments, and sent out tubes which developed into splendid mycelium, and ramified in the animal substances and in the surrounding water. It did not form zoospores, but, on the other hand, it formed oospores in the *interior* of the body of the mites, exactly like those found in the cells of the potato. I pass over here several other observations which were made at this time, because they do not concern the question before us, but I would only remark in reference to the *Pythium*, that it is a species which has not hitherto been described, and which I now call *P. vexans*, because it has occupied me for almost the whole of two long years.

Before entirely leaving this department of the subject, I wish to record another experiment; and in this case also, not because I gained anything positive toward the solution of our problem, but because it shows how carefully one must guard against being deceived in investigations of this kind. For the sowing of *Pythium vexans* I had got, beside others (July 20), half-a-dozen fresh new potatoes. Externally they looked healthy. One was immediately used for experiment and cut in two. I placed a sowing of *Pythium* on the cut surface of the one half; I did not inoculate the other half; each was placed separately under a small glass bell in a moist atmosphere. On the next and the second day the germination of the *Pythium*, as described above, was confirmed in the inoculated half. But on the third or fourth day I was agreeably surprised to find on the inoculated surface the beautiful conidiophores of the potato-fungus.

It is true that they were not growing on the very spot where I had sown the *Pythium vexans*; still, they were close to it. From that point outward to the edge they covered the surface of the section, and they also extended down the thin skin of the external surface for some distance. In these places mycelium was always found in the interior of the tubers. Search was made in vain for a connection between it and the young plants grown from the sowing of the *Pythium*. The non-infected half, which from the beginning of the experiment had been kept quite isolated, also presented, on the same day as the infected half, conidiophores of the potato-fungus on its surface. Up to this point the other potatoes had been preserved in a different place, lying exposed to the dry air of the room. Externally, they appeared to be healthy, with the exception of one or two dark spots on the surface. They were placed without any artificial infection under glass bells in a moist atmosphere, and the disease, together with the eruption of conidia, appeared in all of them in from two to three days. I had, therefore, been working with material which was diseased before I employed it in the experiment; and this need not seem strange when we remember that from the middle of July onwards the potato fields of this district had been frightfully destroyed by *Phytophthora.* Still, the appearance of the conidiophores of the potato-fungus on the half of the potato infected with *Pythium* might have led to a serious and disagreeable deception, but for the opportunity of checking it just described.

7. In the tissues of potatoes penetrated with the mycelium of *Phytophthora*, there sometimes appear other bodies, which might be regarded as oogonia or oospores of the potato-fungus. I have several times found them with *Pythium vexans* in old collapsed tubers which had sprouted in the ground, and once without *Pythium* in a living stalk which had been on the ground. But they were always restricted to those regions which were occupied by the *Phytophthora* mycelium, and always occurred (with one doubtful exception) in the interior of the dead cells of the potato. These bodies, when ripe (see Fig. 7), have a globular form with a fine muricated surface.

Fig. 7. *Artotrogus hydnosporus*, Mont. (?) *from fresh specimens.*



1 and 2. From the stem of a potato; 1875. Magn. 600 diam. 3. Common form, from a diseased tuber of 1874. Magn. 400 diam.

The prominences are sharp protuberances of the colourless, tolerably thin, external membrane. Within this is enclosed a cell, filled with closely packed protoplasm, also of globular form, but with a smooth surface, and having the structure of a *Pythium*-oospore, with thin, almost colourless, epispore. The globular cells are often considerably smaller than the prickly bag which surrounds them, and then they lie loose in it, enclosed in watery liquid. In other specimens this difference of size is so slight that the prickly envelope is all but completely filled up by the smooth cell. The first of these forms in particular greatly reminds one of the oogonium of some *Saprolegnieæ* (of the genera *Saprolegniea* and *Aphanomyces*), which have prickly prominences, and contain a smooth globular oospore. In most cases I found these bodies complete, mature, and without any distinct indication of their being attached to mycelium. It was certainly remarkable that they were often situated close to the inner surface of the cell-walls in places where externally the mycelium of *Phytophthora* undoubtedly ran in the intercellular spaces, or even where a short branch of it penetrated the interior of the cell. All these phenomena were reconciled by the conjecture that the prickly bodies might perhaps be the long sought-for oogonia of *Phytophthora.* But on the other hand they might be of quite different origin, and their former bearers or producers may have disappeared. After long searching in vain, I found in a tuber, in which they occurred along with *Pythium vexans*, an opportunity of at least partially observing their development. They grow on the extremities of the branches of a mycelium, which is very like that of *P. vexans.* The extremity swells out to a globular bladder, which fills with protoplasm, is then separated from its support by a septum, and then sends out, on its entire surface, the slender prominences of the wall. These are at first flat and blunt, and then grow to be sharp prickles. The protoplasm fills them up at first, but ultimately collects itself into the smooth globule which is enclosed in a double smooth membrane. When the bodies are ripe, the mycelium cannot be detected. Though I searched diligently, I have never been able, even with approximate certainty, to discover antheridia. I have made many attempts, but in vain, to cause the prickly bodies to germinate, except in one instance, when I saw a specimen which had apparently sent out a luxuriant, repeatedly dichotomous tube. I was unable to observe its further development.

From all these observations I can determine nothing more than that the star-shaped bodies are the reproductive organs, or spores of a fungus. Their morphological value is uncertain. There is not sufficient evidence to prove that they are sexual organs or oogonia. There is no reason whatever to consider them as belonging to the potato-fungus, unless we base it on the fact that I found them close to that fungus in the course of experiments in search of its oospores.

It is impossible to assign its systematic position to the fungus which bears the star-shaped bodies owing to our defective knowledge of its development. It, however, received a name, if I am not mistaken, more than thirty years ago. In 1845, or perhaps earlier, Montagne found, in a sprouted, but not diseased, potato, a fungus which he called *Artotrogus hydnosporus;* and of which Mr. Berkeley[*] published a short description and engraving in 1846. A dried original specimen of Montagne's which

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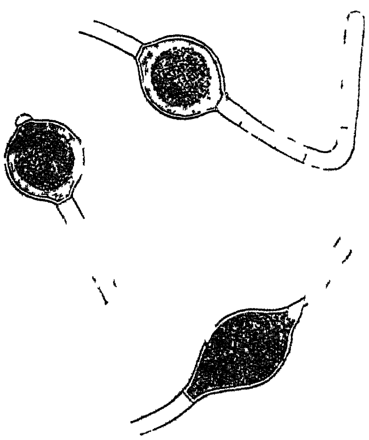
[*] 'Journal of the Horticultural Society,' i. p. 27, pl. 1.

I have examined, presents the following characters: On a sheet of mica is an entirely colourless section of a potato, dried up, the walls of the cells mostly quite empty, but some still retaining starch grains. Many slender threads of fungus, in which for the most part no distinct structure can be any longer recognised, pass through the preparation, and there are besides numerous globular bodies of two kinds, abounding in protoplasm, strewn over it. The one kind cannot with certainty be distinguished from those star-shaped bodies I have described, in which the prickly envelope is entirely filled by the smooth globule. They present no organic connection with the other forms of fungus, but lie free among them. Montagne draws them as isolated organisms, both in the sketch published by Berkeley, and in another which he sent me in 1863. In the second place, the preparation exhibits globular or oval cells with very dense protoplasm, which are somewhat larger in diameter than the prickly ones, and are always distinctly supported on septate fungus threads, mostly intercalated, seldom apparently terminal. The wall of these cells is in many cases moderately thick; in others it appears to be very thick, shining and gelatinous. The granular protoplasm is surrounded, at least in the moistened specimens, with a broad, shining, colourless border, which I can regard only as such a membrane (see Fig. 8). Montagne and Berkeley have explained the globular cells of both kinds as exhibiting progressive steps in their development, the smooth ones being the younger. For this no reason is given, nor have I found any in the renewed examination of the specimens. And one can scarcely conceive, from the known phenomena of development, how the smooth thick-walled cells could become the smaller star-shaped ones. But the fact is, that we have here two forms of fungus, which are locally associated, and which were more easily confused with each other thirty years ago than appears credible to us now. The specific name *hydnosporus* shows that Montagne had drawn it chiefly from the prickly form. The other form

Fig. 8.



Smooth globules on thin mycelium threads, from Montagne's original specimen of *Artotrogus* Magn. 375 diam.

with the smooth globules cannot at the present time be more exactly determined.

8. I had arrived at these results when the notice contributed to 'Nature' (July 22, 1875), by Mr. Worthington G. Smith, on the oospores observed by him in the potato-fungus, reached me. Afterwards I became acquainted with his publications in the 'Gardeners' Chronicle,' and in the 'Journal of the Royal Agricultural Society' (1875), all of which I may be allowed to consider as known to my readers.

I will now confess that my reason for relating the history of *Pythium vexans* and *Artotrogus* so minutely was that I wished to show clearly, by an example, how, without the greatest care in researches of this kind, one may be led into great error, and especially in what way criticism ought to be applied in examining these observations. Let me then examine closely and critically the statements of Mr. Smith.

Mr. Smith describes two kinds of bodies. *First*, brown, warty bodies, which had been named *Protomyces* by Mr. Berkeley, and were found in the brown spots of potato-leaves infested with fungus. In form and size, and in the appearance of their membrane, they have a great similarity to the oospores of *Peronospora Arenariæ*, Berk. ('Nature,' p. 234, fig. E, F; 'Gard. Chron.,' Fig. 19, E). On this ground the bodies were regarded as oospores of a *Peronospora*. They occur on the leaves of potatoes, on which no other *Peronospora* is known except *P. infestans;* and mycelium occurs along with some conidiophores on the same brown spot as the warty bodies, therefore the author believes that they belong to *P. infestans*. There is no distinct evidence for this, not even if we admit that the mycelium and conidiophores in the warty bodies actually belong to *P. infestans*. But fig. 19, quoted above, renders this very doubtful, since the conidiophores (F) present an important difference from those of the real *P. infestans;* and even as regards those which Mr. Smith figures, 'Gard. Chron.,' p. 68, Fig. 9, C, I cannot accept the accompanying statement, that they are the organs mentioned as of *P. infestans*, for it is clear from the text on p. 68 of the 'Gard. Chron.,' that the author does not accurately know the conidiophores of the potato-fungus. I cannot, therefore, hold that it has been positively proved that these warty bodies are oospores, or even that they belong to *P. infestans*. Still, it may be admitted that both these opinions may be correct. Looking still further at the author's description, I find that the bodies occurred very sparingly in the places named. But when, for the purpose of isolating them, the material was placed in water, mycelium grew and ramified luxuriantly in the rotten tissue of the potato, and produced the numerous bodies which are described as the oogonia, antheridia, and oospores of the potato-fungus. These are the *second* subject in the author's description. If the representations given are correct, these objects do not belong to the potato-fungus, and cannot well be oogonia, antheridia, and oospores. I confine myself here to fig. 13, p. 69, of the 'Gard. Chron.;' for the fig. 9, p. 68, of the same, and also the figure on p. 397 of the 'Journal of the Royal Agricultural Society,' represent things which on the face of them show that the preparation could not possibly have had the appearance given to it in the illustration. It will, therefore, be better to leave them out of consideration, especially as, in regard to the question at issue, I should adduce the same objections against them as against fig. 13.

The principal objections are the following:—Fig. 13 represents two kinds of mycelium threads—thick ones and much thinner ones—which are in *local*, but not in *anatomical* relation to each other. The extremities of the branches of both kinds support globular cells rich in protoplasm; larger ones (*m*) on the thick, and smaller ones (*n*) on the thinner threads. The former are called "oogonia"; their protoplasm afterwards withdraws from the original wall, and collects itself into a globular cell enclosed within a special membrane, the "oospore." The globular cells on the thin threads rise mostly free in the surrounding space, many even lie there separated from their pedicels; some are attached to the "oogonia," and on this account they are called "antheridia." The interpretation expressed by these names is based on their supposed similarity to the oogonia, oospores, and antheridia of other fungi, say of *Peronospora*, which are accurately and definitely known. But on closer examination one sees that there is very little similarity. The form, perhaps the structure, also, of the "oogonia," may correspond, but these are unimportant, since they suit also the reproductive cells of different morphological value, in a variety of fungi, as already shown. The same may be said of the antheridia in reference to their form; though I might object that in no known *Peronospora* or *Saprolegniea* do the antheridia possess so regular a globular form as the bodies to which this name is given in the fungi here cited. In all known *Peronosporeæ* and *Saprolegnieæ* the antheridia are not formed until after the extremity of the branch which supports them, and from which they are afterwards separated by a septum, has attached itself to the oogonium, and this attachment takes place in the early stage of both organs. Antheridia originating freely in the surrounding space are, as regards the known forms, at least a great rarity, if indeed they ever occur, but this is a point which I will not here decide. Fig. 13 represents nine "antheridia;" of these, two are attached to the "oogonia;" five others, equally large, rise from their pedicels, and are free in the surrounding space; and two lie beside them quite free. These phenomena entirely disagree with all that is yet known of *Peronosporeæ* and *Saprolegnieæ.*

It is equally opposed to known phenomena that the "antheridia" in question originate from a mycelium which is luxuriantly ramified, and is throughout different and indeed anatomically separate from that which supports the "oogonia." It is true that the branches of *Peronosporeæ* and *Saprolegnieæ* are often of very unequal thickness, and those which support antheridia often thinner than others. But when the relation between the two kinds of branches is traced, it is found that those which support antheridia almost always develop in proximity to the insertion of the oogonia belonging to them, and consequently a special antheridian mycelium by the side of one supporting oogonia would be an unheard of coincidence in the families in question.

One cannot, it is true, say that such phenomena are impossible in these families. They would however require to be regarded as peculiarities in the highest degree remarkable in the potato-fungus if the explanation of the doubtful organs were otherwise beyond question; taken by themselves, they not only do not confirm this explanation, but go decidedly against it.

I look in vain for other reasons in support of this explanation, or to establish even its probability. Grant that those warty bodies which resemble the oospore of *P. Arenariæ* are really oospores, it was surely necessary, at the least, to give a detailed account of their development from the supposed oogonia and antheridia of the macerated preparation, in order to establish the correctness of the explanation given of these doubtful bodies; but that has not been done. I have myself endeavoured to fill up this lacuna by examining preparations of Mr. Smith's, which he has been so good as to communicate to me through Mr. Carruthers, but I have come to an opposite result.

The two preparations which I examined were mounted on glass, and bore the inscription "*Peronospora infestans*, Mont. Resting-spores and oogonia." Both contain, in the liquid in which they are preserved, much granular detritus, obviously the product of the maceration of the potato; then there are distinctly septate threads of mycelium, which, from their form, I should class with *Oidium lactis*, the more so because there likewise exist in the preparations conidia of this common mould, which also grows under water; and lastly, numerous isolated globular bladders, somewhat larger than the oogonia of *Pythium vexans*. These last organisms have a moderately thick membrane, which in many cases is quite smooth, while in others the outer surface is irregular, uneven, and of a very pale brownish-yellow colour. Its protoplasm is shrivelled up into a small, round, central body, no doubt in consequence of maceration. Some of these bladders are still loosely surrounded with a very slender, irregularly folded or shrivelled membrane, which alternately approaches the bladder or retreats from it. It is only to these bladders that the terms oogonia or oospores can be applied; they have as little resemblance to the figures in 'Nature' (fig. E) and in the 'Gard. Chron.' (fig. 19, D) as to the oospores of *P. Arenariæ;* they might rather be compared with the thin-walled oospores of *Peronospora viticola*, or with those of a *Pythium*. But the preparations do not enable me to arrive at a certain result as to what they really are.

There might still be some light thrown on this subject, notwithstanding all this uncertainty, if it were established that the organs in dispute are actually developed on the mycelium of the potato-fungus, and produced on its branches. The illustrations, however, which I have examined, show the contrary. All the threads of mycelium in fig. 13 possess numerous very regularly arranged septa. Now, it is true that septa occur in the mycelium of *P. infestans*, especially when old, but they are always isolated and very irregular. So long, also, as the threads vegetate vigorously under water, they are for the most part entirely without septa. No botanist could accept a mycelium of the structure of fig. 13 as that of a *Peronospora*, unless the clearest evidence for it were furnished from some other quarter. Further, in the preparations examined by me I found, as already stated, the globules without any connection with mycelium.

In conclusion, I will state another objection, which, no doubt, if it stood alone, would have little weight. Mr. Smith found his oospores at an advanced stage of the process of maceration and decay of the parts of the potato in water. Now, so far as experience goes, the potato-fungus is exceedingly sensitive of decay, for as soon as this is developed around it, it speedily dies, whether under water or in the air. But on the other hand, it is known that many other fungi do not begin to grow till decay has appeared.

In the view of all these considerations I may, though with many doubts, accept the warty bodies first described as possibly the oospores of *P. infestans*, but certainly not the forms found in the macerated tubers. It however remains, that Mr. Smith has described two forms of fungus in the macerated material, both different from the potato-fungus, and possibly also from each other. No one would have thought of associating them with the potato-fungus had they not been found in parts of the potato-plant when there was a great desire to discover the oospores of that parasite. To what species of fungus the forms which are represented in the illustrations, and which occur in the preparations, belong, cannot, for the reasons already repeatedly stated, be determined; indeed, the question has no further interest for us here.

9. It is thus apparent that we are not much further advanced to-day than we were fifteen years ago in our knowledge of the morphological peculiarities of the potato-fungus. The warty bodies are possibly its oospores. Should this be indeed the case, their appearance in the potato-plant in Europe is nevertheless so extraordinarily rare that the question suggests itself whether they do not occur more frequently in some other nidus than the potato-plant, or in any other climate than our own. That they will be regularly found somewhere or other is assumed, for our knowledge of the habits of numerous allied fungi makes this more than probable. With this interrogation I leave the domain of morphology and return to the phenomena of adaptation.

As has already been said (page 247), a metœcia or heterœcia in *Phytophthora* may be considered, not indeed impossible, but highly improbable; and if it should exist, there is no indication where to look for it. On the other hand, from the analogy of other *Peronosporeæ*, the conjecture readily suggested itself that the potato-fungus in continuing its development to completion, including the formation of oospores, may make use of some species of host other than the potato-plant, or, if of it, perhaps in some other climate than ours. I do not exclude from this hypothesis an exceptional occurrence of oospores in our potatoes in Europe, for we have such a case in *Cystopus cubicus*, already mentioned.

What this other presumptive and more favourable host plant may be, I am as little able to say now as I was fifteen years ago. The potato-fungus is often found on other species of the order *Solanaceæ* grown in gardens, but without presenting in them phenomena different from those observed when it grows on the potato plant; and, moreover, it is not so frequent on them as on the potato. In *Solanum Dulcamara* (a species indigenous to the British Isles as well as to the Continent), it grows only in a starved condition; it has not yet been observed in other indigenous species. Berkeley has described a case where *Phyt. infestans* occurred on *Anthocercis viscosa*, a New Holland plant of the family of *Scrophulariaceæ*, closely related to the *Solanaceae*. On the strength of this, one might ask whether the plant on which the potato-fungus forms oospores may not perhaps be one of our native *Scrophulariaceæ*, say, one of the field weeds of the genus *Veronica* or *Linaria*. Special investigations in this direction, as well as the examination and comparison of the abundant material made known by the collectors of fungi, have always yielded a purely negative result. *Phytophthora* has not been observed on any indigenous species of *Scrophulariaceæ*, while *Peronospora grisea*, Unger. (*P. sordida*, Berk.), plentiful on species of this family, is entirely different from the potato-fungus.

Here I may mention that this year I found the potato-fungus on an exotic species of *Scrophulariaceæ*, viz. *Schizanthus Grahami*, on which, so far as I know, it had not been observed before. It appeared on this ornamental plant in a garden outside Strasbourg, belonging to Dr. Stahl, in the end of July, when the potato-fields had been extensively attacked by it. The phenomena of destruction were the same as in the potato-plant in stalks, leaves, and buds; the development of the fungus was of extraordinary luxuriance, but here, also, no oogonia were found. This example, at any rate, reveals to us a new host for the *Phytophthora*, and demonstrates the possibility of other species being found in which it may grow not only luxuriantly but also form oospores. The fact that *Schizanthus Grahami* is a Chilian plant, and, therefore, indigenous to the same region as *Solanum tuberosum* and its allies, may not, perhaps, be of any great importance in this connection, still it should be noticed.

It is, perhaps, not very unlikely that the oospores of *Phytophthora* may, in a climate different from that of Central Europe, be found in hosts which do not produce them with us. On that supposition the first place to turn to would be the native land of the potato-plant. But no further observations need be made here on this subject, since it unfortunately belongs only to the region of speculation.

HIBERNATION OF THE POTATO-FUNGUS.

10. To the questions raised at the beginning of section 3 (page 248), concerning the hibernation of the potato-fungus, and the manner in which it returns to the fields in summer, the researches described in the foregoing pages supply no answer, or, at least, not one in any way satisfactory. Even if the often-mentioned warty bodies were hibernating oospores of *Phytophthora*, like the similar oospores of *Peronospora Arenariæ* which resemble them, we should not gain much information bearing upon these questions, since their occurrence is, at the best, extraordinarily rare, while the potato-fungus appears plentifully every year.

In all stages of the development and of the vital phenomena of the potato-fungus, as far as they are known, the parasite acts, apart from the obvious specific peculiarities, precisely as many other plants which disappear in the autumn and return again in the summer, though we know that they do not entirely disappear in winter, but last through it in some form or other—mostly unapparent. These phenomena being everywhere confirmed, we ought not to assume that the potato-fungus is perpetuated in a different manner. If we cannot find hibernating oospores belonging to it (like what are known in most of its allies), another form of hibernation must be looked for and found.

In a former publication* I was, perhaps, the first to call attention distinctly to the fact that the mycelium of *Phytophthora*, like that of parasites living in many other perennial plants, can be perennial in the surviving parts of the host, *i.e.* in the case of the potato, in its tubers. This has been repeatedly mentioned already, and is so easily tested by simple and well-known experiments, that a short statement of it will be enough here.

In large stores of potatoes we very often find some that are diseased, *i.e.* containing the living mycelium of *Phytophthora*. It cannot be disputed that the living fungus may occasionally get into the field through planting such diseased tubers. I do not say that this happens largely; but even if it never happened, the fungus might still, quite unobserved, get into the fields by means of diseased tubers, because, as has been already said, the mycelium in the tuber forms conidiophores directly it is placed in a moist atmosphere, and such a condition is present in the usual temperature of spring. This may be easily seen in fresh sections, or on the injured surfaces, of a diseased tuber. In moist storerooms the conidiophores may burst their way through the unbroken skin, and particularly through the eyes. Should this occur, even in one potato, in one storeroom or cellar, it is clear that the conidia will find their way to other potatoes, and attach themselves to them. If these *quite healthy* tubers should then be planted in the ground, the conidia will germinate, the germs penetrate some of the tubers, and the mycelium develop itself in them. All this is obvious from simple experiments which have been well-known for a long time.

We have thus two ways in which the living fungus that has survived the winter, may in the spring find its way to the fields with the seed. The second is, perhaps, the more usual way; at all events, it is the more dangerous, because, even with great care in the choice of seed, it cannot be avoided with certainty.

In both cases the fungus is placed in the earth along with the tuber, and cannot there leave it; the fungus must die and become corrupt in and with the tuber. It can, however, find its way to the foliage and attack it. The proof of this gives the answer to the question raised by me at the outset.

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* "Recherches sur le Développement de quelques Champignons parasites." 'Annales de Sciences Naturelles,' vol. xx., 1863, p. 1.

The facts which have been observed establish that there are two methods by which the conidia may pass from the tuber to the foliage.

First, it is known that the mycelium of the fungus in the tuber, even when in the ground, is able to produce conidiophores bearing conidia directly from the tuber. We can easily see how the conidia thus produced could reach the foliage—they might be carried up either by the growing plant which may have touched them, or by small animals which frequent both situations. Neither of these methods can be easily detected. Moreover, the formation of conidia in the soil cannot be very frequent. There should, therefore, perhaps, be little weight attached to this method.

The *second* method can be easily observed and with great exactness. It consists in the mycelium growing from the tubers in and with the young plants, and producing conidia on them in the usual way; and these, of course, extend the fungus to the healthy plants beside them.

In 1861* I called attention to the fact that tubers containing *Phytophthora*, when they are growing, not unfrequently send out shoots into which the fungus passes from the tuber. The fungus advancing slowly in its growth, at last kills the shoots which, for the most part, were always in a sickly condition. The same tubers, as is known, may also send out healthy shoots. At the same time I further showed, that under special circumstances the fungus in these diseased shoots develops conidia, which become centres for the further spread of the disease. These were not conjectures, but facts observed in experiments. The observations, however, were not made in the open field, but in the house and laboratory, and had not been confirmed by myself or observed by others in the open field. It was, therefore, a question whether these results were only to be obtained artificially or really occurred in the field, and this could not be decided except by experiment. Accordingly, in 1874, in prosecuting the investigations undertaken at the request of the Council of the Royal Agricultural Society, I made an experiment in the garden. A potato, with a tolerably well-developed shoot, containing *Phytophthora*, was planted in the garden with several others which had vigorous and healthy foliage. The diseased shoot was discoloured for some distance along the stalk, but continued to grow for a while; the brown places died off by degrees, were completely dried up, and no infection spread to its healthy neighbours all through the summer, though several healthy stalks had come into direct contact with the diseased one. Repeated examination with the microscope showed that the sickly shoot actually contained *Phytophthora;* kept moist under a bell-glass it formed conidia, but while in the open-air no conidiophores were observed. The weather during the experiment was not unusually dry.

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* 'Die gegenwärtige Kartoffelkrankheit.'

The negative result thus obtained caused me to doubt whether my previous explanation could hold good in the open field, and this opinion I stated in a letter to the Secretary of the Society.

Still, it would not have been justifiable to come to a final judgment from a single failure in an experiment dealing with such complicated materials as two kinds of living plants, and the phenomena connected with their relation to each other, and the influence of the weather upon them. I accordingly repeated the experiment during the present year (1875). In March, about 50 healthy potatoes were inoculated at the eyes by fresh conidia. No exact test was applied to ascertain whether the infection had taken place; the result, however, showed that it had succeeded in most cases, though not in all. On the 2nd of April the tubers were planted in common garden-soil, in a box without a bottom, and open to the air—that is to say, in a miniature garden, which, in order to be more easily looked after, was thus fenced in. The tubers sent out shoots in a normal manner; many, even of the specimens known to be diseased, producing undoubtedly healthy foliage. One, a red kidney, was specially distinguishable from the rest, because the six shoots which it sent above ground remained in a wretched condition. On May 12th these shoots had become brown; I cut off one of them for microscopic examination and found the living fungus in it; the presence of the fungus in the tuber was also afterwards confirmed. The other five shoots were left, and, up to the 17th, remained unchanged, without any appearance of conidia. On the following night a warm heavy rain fell, and on the morning of the 18th the stalks and petioles of the five shoots were thickly covered by conidiophores with mature conidia. On the healthy foliage of the other plants there was no trace of the fungus as late as the 20th; but on the morning of the 21st two leaflets on the upper part of a branch, which was near the five sickly shoots, presented the characteristic spots of the *Phytophthora*, and on the lower surface of the leaf where these spots occurred, conidia were produced; no further indications of the disease were visible to the naked eye. From May 25th onwards, the fungus spots were to be seen plentifully scattered without order on the stalks, petioles, and leaves of all the plants. About the same time several other diseased tubers also gave off small shoots, into which the mycelium of the fungus had passed from the tuber; no further observation, however, was made on them, because the disease was then far advanced everywhere. Most of the shoots were still quite healthy at their base. They could not, therefore, have received the infection from their tubers, but it could only have come from the conidia produced on the five diseased shoots. To remove all doubts on this point, several stocks were entirely dug up and closely examined in all parts. Two red kidneys had the old tuber still turgent, and altogether free from the fungus; the base of the shoots was likewise entirely free from the fungus, while in the upper part the fungus spots existed in abundance. During all this time to the end of May, there was nothing remarkable in the weather; it was, in general, moderately moist. The wet weather, under the influence of which the fields here suffered so much from *Phytophthora*, did not come till much later; and at the time when my experiment was completed, I did not, in a number of excursions specially made for the purpose discover any *Phytophthora* in the fields. The garden in which the experiment was made was in the town, far from the fields; it is to be hoped my experiment was not the means of extending the infection to the fields.

The results I have described having been accurately ascertained, the problem before us is, as far as possible, solved; that is to say, I have shown that the oospores are not found in this district, and that the perennial mycelium discharges the function of hibernation which is proper to the oospores in other species.

I may in a few words draw attention to this fact, that the generally known phenomena connected with the occurrence of the fungus correspond completely with the result at which I have arrived. This may not at first sight appear to be the case, for while the first infection of the plants in the fields takes place, as we see, in spring, the occurrence of *Phytophthora* is seldom plainly visible before July. But then even in large fields there can hardly be more than a few original seats of infection, since comparatively few diseased potatoes will be planted, while numbers of the diseased tubers actually planted are rendered harmless, from the fungus not forming conidia either in them or in their shoots. There must be a very large quantity of conidia to enable the fungus to spread over extensive areas. A comparatively small quantity only can be produced at first in the primary seat of infection. The original development of the fungus, and the production of secondary centres of infection, must therefore proceed slowly and unnoticed. That is to say, the fungus needs time to acquire the quantity of reproductive conidia necessary to affect large areas. Were it not so, the potato-plant in damp places or in damp years would be attacked in spring and perish. It may not be superfluous to say that the case could scarcely be different if the fungus hibernated by means of oospores, which germinate in spring. Of course, if they were of rare occurrence, then the actual state of things at present would be brought about; but if they occurred very frequently, then an immediate and general attack of the disease in the spring would be unavoidable.

I have only to add to what I have said, that the vegetation of *Phytophthora* is known to be largely hastened and assisted by damp, and, on the other hand, to be retarded by drought. As a rule, however, the period of its first appearance is followed by the dry season of the summer. The period of its spreading extensively usually coincides with the beginning of the wet autumn, or, as was to be seen here in 1875, with the wet seasons in the height of summer. In particular localities it may even occur on the plant before the arrival of these seasons, as in the valleys among our mountains, where there are regular heavy dews and comparatively numerous showers. In conclusion, attention should also be directed to the possibility of there being a connection between the phenomena in question, and the fact that the potato-plant in its various stages of development supplies a varying nidus for the fungus. From large experience, I consider it probable that *Phytophthora* grows more easily on a plant at the height of its development than on young stalks and leaves. It would be interesting, but not easy, to establish this clearly by experiment. It is a question, however, which would lead me beyond the limits of my present task were I to follow it out to its issue.

Strasbourg, December, 1875.

X.—*Report on the Health of the Animals of the Farm.* By JAMES B. SIMONDS, Principal of the Royal Veterinary College.

FOOT-AND-MOUTH DISEASE.

IT may perhaps be affirmed that no Report on "the health of the animals of the farm" during the last six months of the year 1875 would be considered satisfactory, unless notice were taken of the prevalence of the "foot-and-mouth disease," notwithstanding that the subject has been so often and so well treated by writers on veterinary medicine, and the science and practice of agriculture, as well as by other persons who have an interest more or less direct in this important question. Doubtless the disease has been widely diffused, and has produced serious losses to the owners of cattle; but to me it appears that the public excitement on the subject has not been exclusively due to either or both of these causes. It is to be remembered that on the introduction of cattle-plague in 1865, legislative measures were adopted for the suppression of this and other contagious diseases of animals which constitute a considerable proportion of the wealth of the country, as well as the food of the people, and that they proved eminently successful in so far as the extermination of cattle-plague was concerned. We see in this fact one cause of the excitement which has prevailed; and perhaps but for it, foot-and-mouth disease would have run its ordinary course as much unheeded in 1875 as in any of its former outbreaks in this country.

It has been repeatedly stated, and of this I am a witness, that foot-and-mouth disease was first seen in England—at least during the present generation—in the summer of 1839. At that time the importation of foreign cattle, sheep, and pigs was interdicted, and so continued until 1842; a fact of considerable importance, as bearing on the question how imported animals should be dealt with to avoid the introduction of contagious diseases. The history of these diseases of animals traces far back into the ages of the past, and shows that they are not confined to any particular country or clime. Foot-and-mouth disease can be recognised in these early histories, and without going further back than the last 150 years, we have for this period fair descriptions of periodic outbreaks of this malady on the continent of Europe. Shortly before its appearance here, the disease prevailed extensively in Hungary and in Lower Austria, viz. in 1834, and quickly extending the area of its existence, it was seen in turn in Bohemia, Saxony, Prussia, the German States, Belgium, Holland, and France, and lastly in England, where it has since remained, despite all efforts to effect its extermination.

As may be supposed, various theories were promulgated in 1839–40 with regard to the causes giving rise to the malady. The one which took the firmest hold of the public mind was that which attributed the affection to atmospheric influences, and hence it soon came to be designated "the cattle-epidemic." This view is even still held by some persons; while almost without exception those who have investigated the pathology of the disease are agreed that its extension is due to infection, and that the infecting material may be carried from animal to animal by indirect as well as by direct means.

Although it is not known how the malady was introduced into England, it was satisfactorily shown at the time that the first cases occurred at Stratford and Bow, in August of 1839, and at no very great distance from some of the docks. This fact has given rise to the theory that the infecting material was probably conveyed hither by merchandise, or by ship-stores—that is, animals which had been taken on board as food-supplies for the crew. On a ship coming into dock with surplus animals of this kind, they would, at that time, on being debarked, be either sold for immediate slaughter on the spot, or kept within the area of the docks for embarkation when required. Given that a diseased ox or cow, sheep or pig, had been thus brought into dock, and it is easy enough to understand how such an infectious malady as foot-and-mouth disease might be spread from a centre of this kind and gain a firm footing in the country.

Be this as it may, the disease soon reached the London dairies, and very shortly afterwards was observed among the animals in Old Smithfield market. Cases of the malady occurred very early in different parts of the country, and it is a singular fact that the first report of such cases came from the county of Norfolk in the month of November, 1839. How foot-and-mouth disease reached that county was not ascertained, for at that time no special investigation was made, it not being known to those who were called to the animals that an infectious cattle-disease had reached our shores.

In the year 1839, I was residing at Twickenham, Middlesex, and was partly engaged in agricultural pursuits. Soon I heard of a "new disease" having broken out at a farm at Laleham, and professional zeal induced me to visit the place to learn more of the matter. Here I confronted foot-and-mouth disease for the first time, and at once satisfied myself that I had to deal with a contagious malady. The history of the outbreak was simple enough. Two calves, not more than seven or eight days old, had been bought in Smithfield Market, and taken to the farm as "sucklers." Each had come from an infected London dairy, and were themselves diseased, although not known to be so by the purchaser. They were placed on two cows, and three days afterwards these cows were found to be ill. Alarmed at this, the owner separated these cows from his other stock, notwithstanding which the disease spread, although its rapidity of so doing was somewhat checked. Other outbreaks soon followed on this, and almost, without exception, they all depended on the purchase of calves in Smithfield Market.

On one of my visits to an infected herd, I was induced to saturate a small lock of hay with the saliva which was flowing freely from the mouth of a diseased cow, and carry it back to my place. Here I selected a cow for experiment, and having previously had her isolated and well secured, I placed the lock of hay in her mouth, taking care to keep it there for a few minutes, and to have it well bruised between her teeth. In the short space of about *forty hours* she was found to be unwell, and on examination, vesicles had commenced to form upon her tongue and also between her digits. The disease took its usual course, and vesicles were early developed upon her teats. Having thus proved that the secretions from the mouth contained infecting material, I was induced to continue my experiments, and next resolved on ascertaining whether the milk contained similar material.

Already I had seen on one of the farms I had visited some pigs suffering from the malady, and fortunately I had some young pigs at hand, which were at an age fit to take from the sow. They were divided into two lots, one of which was removed and put into a place of security, as far as possible from all other animals. Here they were kept without food for a few hours, and then some warm milk from the experimentally diseased cow was given them. This they eagerly partook of, consuming probably about a pint each. Subsequently they were fed on meal and milk from a healthy source, the same as supplied to the other moiety of the litter. Between *fifty and sixty hours* afterwards every one of the experimental pigs was suffering from the disease. I had now proof, by direct experiment, that the lacteal secretion was also impregnated with the *materies morbi* of the disease, and that by its use the malady could be communicated from animal to animal. The strictest sequestration of the diseased animals was observed, not only during their illness, but for some time afterwards, by which means every other cow and pig on the premises escaped an attack.

My next experiments were of a different order, and attended with a different result, which, however, is not without its value. In examining some cows on a farm, three or four miles distant from Twickenham, I observed on the teats of two or three of them some remarkably large vesicles, which were filled with a yellow-coloured and transparent fluid, apparently having the characters of ordinary serum. This I collected, and with care obtained nearly a tea-spoonful. Arriving at home, I inoculated a healthy cow with this fluid, taking all the precautions which I had done previously as to sequestration. The animal was carefully watched, but no ill effects followed. The experiment was subsequently repeated, and again with a negative result. I may conclude this description of my original experiments, by remarking that I had thus early established facts in relation to the pathology of foot-and-mouth disease which years of subsequent experience have only tended to confirm.

By the natural spread of the malady, many cattle, sheep, and pigs, and even the poultry, became affected in Twickenham and its neighbourhood. This afforded me the opportunity of testing the protective influence of my experimentally produced case of foot-and-mouth disease by placing the cow with affected animals. This was done and no ill consequences resulted.

It may be here added, that cases of escape from secondary attacks had become so numerous during the first years of the existence of the malady, that in every part of the country the opinion was held that animals could not contract foot-and-mouth disease a second time. This opinion, however, has long since been disproved, and I may add that I have since had many positive proofs of cows being affected even a *third* time with the malady; a notable instance of which I shall hereafter describe. Referring again to some original experiments of inoculation with the fluid contents of vesicles, carefully collected so as to be free from the admixture of any other matter, I may state that Mr. Ceely, of Aylesbury—one of the best-known investigators of variolous diseases—inoculated two of his cows with fluid of this description in April 1840, and that no effects were produced. The late Mr. Lepper, veterinary surgeon of the same place, had also recourse to similar experiments. Two cows, belonging to himself, were inoculated within a few days of those above named—the property of Mr. Ceely—by making incisions on the posterior part of the mammary gland, and on either side of the *labia pudendi*, and placing within each a shred of lint saturated with the contents of vesicles. No effects being produced by the fourth day, some more fluid was introduced into the incisions. Slight constitutional disturbance followed very quickly, but lasted only a few hours, when the animals regained their ordinary health. These cows were, eighteen days afterwards, placed with a number of diseased cattle on a farmer's premises, where they remained for a fortnight, but did not contract the disease. Whether their escape was due to the inoculation was not, however, determined, for so rapidly did the disease spread in all directions, that no opportunities were afforded for additional experiments. Mr. Lepper attempted one, but was foiled by the experimental cow falling ill with the natural disease two days subsequently to her inoculation.

I may here repeat the statement I have frequently made, that the attacks of foot-and-mouth disease were more malignant and more widely diffused in 1840-1 than at any time since then. It is also to be remembered that periodic outbreaks of the malady have occurred every few years since 1840-1. Thus, in 1845 a second malignant outbreak took place, and this was followed by others in 1852, 1861-2, 1869-70, 1871, and lastly by the well-known one of 1875. On each of these occasions, and even when the disease progresses in its ordinary manner, cases have occurred which could not be traced to cohabitation, nor to any ascertained means by which the *materies morbi* could be conveyed from the diseased to the healthy animal. An instance of this kind took place on the College premises in the year 1870. A cow which had been kept for upwards of a year in a shed completely isolated from the rest of the premises, and into which no other cow, sheep, or pig had been brought, nor any known substance likely to have been charged with infecting material, was found one morning to be suffering from foot-and-mouth disease. The attack was not a severe one, and in the course of a few days the animal was convalescent.

Although few animals when exposed to the infection escape the disease—unless they have previously been the subjects of an attack—still a considerable difference is found to exist with regard to their susceptibility to be acted upon by the *contagium*.

Pregnant animals, and especially those which are near the time of parturition, are far more susceptible to the infection than others. Milking-cows are also easily acted on, and are often the first to be attacked on a farmer's premises. Cattle which are travelled from place to place, whether fat or store animals, are thereby rendered more susceptible to the disease. This fact explains, in part, how it is that Irish stores which are landed in England are so often found to be affected within a few days of their arrival. In the early days of the malady, especially in 1840-1, nothing was more common than for a lot of beasts sent by road, as the practice then was, to Smithfield Market to fall ill on the way, or to reach the market in a most exhausted condition from the severity of the attack; while the animals left at home on the farmer's premises, from which those sent to market had been selected, remained perfectly healthy. Sheep suffered in the same way, and to an equal extent; and in many of my weekly visits to Smithfield I have picked up a dozen hoofs or more which had been detached from the feet of sheep while being driven into or from the market, or moved from pen to pen by the drovers. Railway travelling has spared many scenes of this kind, and saved much suffering; but, at the same time, the want of cleansing and disinfecting of the trucks has tended greatly to spread foot-and-mouth disease more rapidly through the country.

The impurity of the water supplied to animals has also often had to do with their increased susceptibility. Some of the most malignant cases of the malady which have been submitted to my notice have arisen from this cause. In one instance in particular, where the washings from a kennel found their way into a brook, from which some valuable Shorthorn cows drunk, several of the animals died from the malignancy of the attack. In this case, also, it was not a little remarkable that the disease was not known to exist anywhere within a mile of the premises. Not only are animals at the time of parturition more susceptible to the infection, but the most serious ill-effects are produced on their young when they are attacked. Calves, lambs, and pigs die speedily under such circumstances, and the losses often are most serious to the farmer. The milk of the dam is so charged with morbific matter as to be in many instances rapidly destructive to the life of the young animal.

A remarkable case of this occurred, in March, 1861, on a farm I then occupied. It was my practice to have four calves suckled at a time by a cow which had just calved, for the purpose of weaning them when a few weeks old. They were allowed access to the cow morning and evening, and in the interim were tempted to partake of cooked food, which they soon would do as a rule. The details of this plan need not, however, be named in a report of this kind. They have been named before, and are well known to many rearers of calves. When properly carried out, a good cow will sometimes rear ten calves in the course of a year. One of my best cows calved, and in addition to her own calf, three young calves, a few days old, were placed upon her on the second day after parturition. All the stock on the farm at the time were free from foot-and-mouth disease; but I happened to make a new purchase of a cow which, unfortunately, on arrival a few days after, was found to be affected with the malady. She was kept apart from the others, but, nevertheless, the infection spread. On the sixth or seventh day following parturition, on the calves being placed with the cow in the evening, one of them, the cow's own calf, died suddenly; indeed, almost in the act of sucking. In a little more than an hour after its death a second calf died, and by about the expiration of three hours from the time of sucking a third calf died.

An examination of the cow showed that she was in a state of febrile excitation—affected, in fact, with premonitory symptoms of foot-and-mouth disease. In a few more hours the malady was thoroughly established, and a full eruption of vesicles existed in her mouth, on her teats, and between her digits. Much to my surprise, the fourth calf was found to be perfectly well on the following day; and on making inquiries of the herdsman, he said that he could explain the cause of its safety, for that on the day preceding the cow's illness he had placed this calf with another cow, as he believed the four calves were scarcely having milk enough. Strict isolation being carried out, the fourth calf fortunately escaped. This case, besides distinctly proving the poisonous quality of the milk to the calves, is an important one in another respect. The cow had been in my possession nearly three years, and twice during that time had been affected with foot-and-mouth disease, so that the attack which I have described was the *third* from which she suffered.

In the former part of this Report mention has been made of periodic outbreaks of the disease, and it has been stated that on these occasions it assumes a more serious type. In this respect foot-and-mouth disease forms no exception to contagious affections in general, of which it may be affirmed that the greater the number of cases, the greater will be the malignancy of the malady. On occasions like these, persons are far more disposed to be busy with their remedies than when the disease assumes a milder form. If medical treatment be called for ordinarily, it certainly should now be more cautiously adopted. On the first appearance of the disease in this country, this principle had not been fully recognised, and veterinary surgeons as well as agriculturists adopted the opposite course. Animals were dosed with medicine early and late, and local remedies were as perseveringly had recourse to. These energetic means of cure proved the most effectual ones to kill, and hence, in part, the great fatality which attended the outbreak of 1840-1, and also that of 1845. On the decline of the disease in 1845, a knowledge of the true principle of dealing with the malady became diffused. The nursing system took the place of the doctoring one; and very soon so little was thought of the disease, that it was a common remark among farmers that they preferred their animals to "have the epidemic," as it was found that they usually gained condition more rapidly afterwards.

In concluding this Report on foot-and-mouth disease, I may observe that the serious outbreak of last year gives evidences of being on the decline, and it is much to be hoped that before long the country will be again free from foot-and-mouth disease to the same extent as at any former period.

PLEURO-PNEUMONIA.

The appearance of this disease in England, like the one I have been considering, certainly preceded the alteration of the tariff in July, 1842. It was recognised in several of the London dairies in the winter of 1841-2 by different veterinary surgeons, and, among others, by the late Professor Spooner and myself. At a meeting of the Veterinary Medical Association, held February 22nd, 1842, Professor Spooner stated that he had that day visited Mr. Rhoade's dairy, and seen several cows suffering from the malady in its different stages. He reported, also, that he had examined the lungs of an animal which had died of the disease in the same dairy.

By what means pleuro-pneumonia gained a footing in England is not known, although it has been assigned to the importation of diseased animals from Ireland, into which country it has been asserted that it had been carried by some Dutch cows in 1839-40, which the British Consul in Holland had sent to Cork at the request of some of his friends. The difficulty in the way of this theory is, that the importation of animals into the British Islands was at that time strictly interdicted. Gaining a footing in England in 1841, the disease spread, but not so rapidly as to excite any great apprehensions in the public mind. Before the end of the year 1842, however, accounts had reached the Royal Veterinary College of cases having occurred in Essex, Cambridgeshire, Suffolk, Norfolk, Buckinghamshire, Leicestershire, Staffordshire, Lancashire, and Shropshire.

In October, 1842, I had recourse to an experiment to determine, if possible, the period of incubation of the disease, as the facts already ascertained by different observers as to the rate and the uncertainty of its progress among cattle with which diseased animals were herded were very discrepant. A cow suffering from pleuro-pneumonia was purchased, and brought upon the College premises, where she was put with a healthy cow which had been some time in my possession. The two animals were allowed to occupy the same shed for a few days, when the diseased cow died. In about three weeks from the time of the exposure, the experimental cow gave indications of being diseased. The symptoms of pleuro-pneumonia gradually developed themselves, and in seven or eight days from its commencement the case terminated fatally.

The chief value, perhaps, attaching to this experiment is that of assisting to determine how early pleuro-pneumonia may be developed in an animal exposed to the disease by cohabitation; for the length of time the morbific matter may lie dormant in the system has yet to be determined. Observations made on infected herds would seem to place this at the end of months, rather than weeks, and among numerous cases of this kind I may name one in which it was satisfactorily proved that the period could not possibly be less than ten weeks and three days. The solution of this one problem relating to pleuro-pneumonia can only be determined by a long series of experiments specially directed to it alone, and must, I conceive, be undertaken on a large scale and at considerable expense. The scientific investigator at once recognises the importance of a correct solution of the question, because he sees the error into which he might otherwise fall in undertaking experiments to determine the means by which the disease is propagated.

At present I hold the opinion that cohabitation appears to be absolutely necessary to the successful conveyance of the morbific matter from one animal to another in a form by which it can produce its specific consequences; and until the *materies morbi* of pleuro-pneumonia be conveyed from a distance, and made to take effect on an animal whose perfectly healthy condition could not be disputed, I feel justified in maintaining this opinion. It is to be borne in mind that this belief is the outcome of years of observation, and of experiments had recourse to specially to determine the question. It has been objected that the experiments are few, which I am ready to grant; but I may reply, that this objection does not apply to inoculation with the diseased products of pleuro-pneumonia. Thousands upon thousands of cattle have, during the last twenty-four years, been thus experimented upon without any affection of the lungs being produced. Indeed, the advocates of this system base its value upon the prevention of pleuro-pneumonia by the introduction of the morbific matter into the organism of healthy cattle. No difficulty exists in conveying from a distance, undefined and undefinable as to extent, the morbific matter of cattle-plague, sheep-pox, foot-and-mouth disease, and of the numerous blood diseases known by different local terms which are fatal to cattle; and when the same thing is accomplished by experimenters with 'the morbid products of pleuro-pneumonia, I will readily admit that my belief has been resting on an erroneous conclusion as to the means by which the malady is spread over the country.

I may here mention some other circumstances which have been established of late years with regard to the extension of pleuro-pneumonia, which bear on what has been previously advanced, *viz.*, that the malady had no existence in Australia until introduced in 1858 by a diseased cow from England; nor in New Zealand until 1864, when some infected cattle were landed from Australia; that America was free until 1847, when cattle from England took the disease to New Jersey, and that the importer, by slaughtering his entire herd, eradicated the malady at that time. That America remained free until 1859, when she again received the disease from Holland by imported cattle, and that unfortunately it then gained a footing in the country. Sweden is also said to have received the disease by infected cattle sent from England in 1847, and from thence it spread to Denmark. Norway likewise suffered from the ravages of the disease in 1860, it having been imported by a number of Ayrshire cattle from Scotland for breeding purposes, which proved to be affected with pleuro-pneumonia.

TYPHOID FEVER IN PIGS.

In my last half-yearly Report attention was directed to the circumstance that a malignant disease had shown itself among some large herds of pigs in the western counties, more particularly in the neighbourhood of Bath and Bristol, and that my colleague, Professor Axe, had already undertaken to investigate its pathology. It was also stated that the affection was believed to be only another outbreak of the malady long since recognised in this country by the name of typhoid fever.

This opinion has since been confirmed, and the experiments which have been had recourse to by Mr. Axe have thrown considerable light upon the causes by which the disease is propagated, as well as on the means of its extinction. They, at the same time, confirm the opinion of Dr. William Budd, of Clifton, who, in 1865, brought the subject of this disease of pigs before the Society, and clearly established its close relationship with typhoid fever of man.

Experiment I.—The chief object of this experiment was to determine whether the *contagium* of pig-typhoid could be transmitted from one animal to another through the medium of the atmosphere alone, positive contact being entirely prevented.

For this purpose, two pigs, about six months old, were obtained from a healthy herd, and on the 21st of April they were put into a house near to a diseased pig, brought to the College by Mr. Hussey, of Devizes. After forty-eight hours close exposure of the healthy pigs to the *contagium*, the diseased animal was destroyed. The healthy animals were placed some distance apart from the infected one, and the greatest possible care was taken to maintain a complete separation of the animals themselves, and also that the excreta of the infected pig should not come in contact with the experimental animals. The internal temperature was taken in the mornings and evenings throughout the entire course of the malady, and will be found recorded in the following thermometrical table.

The course of the disease as it appeared in the two pigs, A and B, is described separately.

A.—*April 26th.*—Slight dulness is apparent. The evening meal is refused, excepting the fluid portion of it, which is drunk with avidity.

27th.—Dulness more marked; the skin of face is corrugated, and the countenance expressive of pain.

28th.—The skin is hotter than natural, but no eruption is developed. The eyes are congested and suffused with tears. Food is taken sparingly, but water is drunk freely; pulse is quick, soft, and weak; breathing very slightly accelerated.

29th.—The temperature of the skin is increased, and a general redness is visible over the belly and on the inside of the arms and thighs, and behind the ears.

30th.—A few round raised spots of a red colour are visible on the breast and throat. Dulness is much increased, and a great desire for warmth is manifested. A watery discharge issues from the eyes, and dirt accumulates around them in black, scaly masses.

May 1st.—The discharge from the eyes is thick and puriform, and a watery defluxion issues from the nostrils; the eruptive spots are still visible, but the general redness of the skin has subsided, and its heat is less intense.

2nd.—Signs of emaciation are present, and the animal's movements are feeble. The spots on the skin are subsiding and can now be only felt; the redness has disappeared. The general symptoms of illness are less marked, but the thirst is intense, and slight tremors are present.

3rd.—Much the same as yesterday.

4th.—The bowels are constipated, and the fæces streaked with blood and thick tenacious mucus. The lining membrane of the rectum is of a scarlet hue. More food is taken, and the thirst is less severe.

5th.—Skin still very hot, and animal refuses food; the thirst is increased; the movements are unsteady, and rigors are excited by the least exposure.

6th.—A diffused redness is visible over the belly, which is most intense towards the centre; the inner side of the arms and thighs are also red, but less so than the surface of the abdomen. Great prostration is now apparent, and rapid emaciation is taking place. All the other symptoms are aggravated.

7th.—A fresh crop of eruptive spots has appeared, but the animal appears somewhat more cheerful, though he obstinately refuses food, and drinks largely. The stools are soft, and of a yellowish-brown colour.

8th.—The face is pinched and the expression very anxious, but the eyes are bright: the lids charged with puriform matter. The eruption is more extensive and decided. Great irritation is manifested by the animal repeatedly scratching the abdomen. The bowels are very loose, and the stools decidedly more yellow in colour.

9th.—Diarrhœa exists. The stools of a dirty yellow colour and watery. Prostration increasing. Food altogether refused; thirst still great.

10th.—The epidermis is desquamating from the site of the first eruption, and slight moisture is observable on the surface of the more recent spots. The stools are watery and frequent, and pain is evinced on pressing the belly.

11*th.*—Stools streaked with blood; belly and inner side of thighs and arms intensely red and hot. The countenance is expressive of stupidity, and at short intervals slight twitchings of the muscles are perceived. The hind extremities are partially paralysed, and the body has a rolling movement.

12*th.*—The skin exhibits a number of purple patches and small petechiæ. These are especially numerous on the belly and on the inner part of the thighs. Thirst is very great.

13*th.*—All the general symptoms are aggravated.

14*th.*—Same as yesterday.

15*th.*—Fæces black and stinking. Conjunctival membrane studded with petechiæ; abdomen very sensitive; nothing is partaken of but fluids. A feeble grunt is emitted with each expiration, and complete paralysis is present.

16*th.*—The fæces are less fluid; and, excepting where the blood-spots and patches are, the skin is much paler in colour.

17*th.*—Extreme prostration is present, and dissolution seems to be fast approaching. The fæces are mingled with blood and small particles of soft grey sloughs. The entire body is convulsed, and, as the animal lies, the legs are violently jerked towards the trunk.

18*th.*—The convulsions continued throughout the day. Animal died at 6 o'clock P.M.

PIG B.—*April* 28*th.*—Slight dulness is perceptible, and the food is partaken of indifferently. There is marked thirst, and the skin is hotter than natural.

29*th.*—Much the same as yesterday.

30*th.*—The skin is intensely hot and of a deep red colour; dulness is increased, and the face slightly pinched.

May 1*st.*—The red colour of the skin is less diffused, and a rash has appeared in irregular patches; the appetite is very fastidious and the thirst intense.

2*nd.*—A watery discharge issues from the eyes and nostrils; but in other respects there is no perceptible change.

3*rd.*—A few small red spots exist on the belly and on the throat; dulness is more marked; the skin of face is more corrugated, and the countenance expressive of pain. The movements are somewhat feeble, and rigors are present.

4*th.*—A few more spots have appeared, and on some of yesterday's crop a little moisture is visible.

5*th.*—Food is entirely refused, and the animal is evidently much weaker; the pulse is quick and feeble; the bowels constipated, and the discharge from the eyes and nostrils is assuming a puriform character.

6th.—A fresh eruption of spots has occurred on the inner parts of the arms and thighs, also behind the ears; they are very numerous, and in some places confluent. The spots erupted on the 3rd have entirely disappeared, leaving the epithelium raised and desquamating. Prostration is great, and shivering is excited by the least exposure.

7th.—There is no perceptible alteration.

8th.—The countenance has a stupid expression. The conjunctival membrane is much injected; the skin is intensely hot, especially on the abdomen; the primary spots are turning to a yellowish-brown colour, but those of the second crop are subsiding.

9th.—The prostration is very great and the gait unsteady. The spots have almost entirely disappeared. On the inner part of the thighs are two large vesicles, and on the breast two others. Diarrhœa is now present, and the fæces are very offensive ; the skin is much cooler, and less red than at any time since the eruption. The tips of the ears are of a bluish-red colour.

10th.—The vesicles* are increasing in number, and some are confluent; there is considerable emaciation, and the slightest exertion gives rise to a fit of coughing. There is every indication of pneumonic complication.

11th.—Vesication is extending, and large layers of epidermis may now be removed from the seat of the confluent vesicles. Diarrhœa is very acute; the stools are of very yellow colour, fluid, and offensive. The animal rises with difficulty, and rolls from side to side in progression. Vision is much impaired. The breathing is quick and panting. Pressure to the abdomen excites struggling and squealing—which, however, is very feeble and plaintive, and attended with a cough.

12th.—Emaciation is rapidly increasing, and there is complete prostration, with low delirious grunting. The skin is turning purple in patches, and petechial spots are scattered over the abdomen. Some of the vesicles are refilling. The extremities are cold, and the breathing is quick and hoarse.

13th.—The animal died, after being in a comatose condition for several hours.

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* A number of "ivory points" were charged with virus from these vesicles for inoculating purposes. See Experiment II.

PIG TYPHOID THERMOMETRICAL TABLE.*

EXPERIMENT I.

A.

Date.	Morning.	Evening.	Date.	Morning.	Evening.
April 20	103°·2	103°·8	May 5	102°·4	105°·2
,, 21	102·6	103·6	,, 6	106·0	104·6
,, 22	103·4	103·6	,, 7	104·0	104·6
,, 23	103·0	103·2	,, 8	104·4	104·8
,, 24	103·2	103·2	,, 9	104·6	104·0
,, 25	103·0	103·4	,, 10	103·0	104·0
,, 26	103·2	103·2	,, 11	104·0	105·2
,, 27	103·6	103·2	,, 12	105·0	105·0
,, 28	104·0	104·2	,, 13	104·0	104·0
,, 29	104·0	104·6	,, 14	104·0	105·0
,, 30	104·2	104·6	,, 15	106·0	106·4
May 1	104·6	105·0	,, 16	103·6	103·0
,, 2	105·0	106·4	,, 17	103·8	102·0
,, 3	104·8	105·2	,, 18	96·0	00·0
,, 4	105·2	105·0			

B.

Date.	Morning.	Evening.	Date.	Morning.	Evening.
April 20	103°·2	103°·2	May 2	103°·0	104°·0
,, 21	102·0	103·2	,, 3	103·8	104·8
,, 22	103·2	102·6	,, 4	105·2	105·2
,, 23	102·6	103·0	,, 5	104·0	105·4
,, 24	103·0	103·2	,, 6	105·8	105·2
,, 25	103·4	106·0	,, 7	104·8	105·2
,, 26	103·6	104·0	,, 8	106·2	105·2
,, 27	103·6	103·4	,, 9	104·6	103·0
,, 28	104·0	104·2	,, 10	104·0	104·4
,, 29	102·0	104·6	,, 11	101·8	105·2
,, 30	104·0	104·6	,, 12	96·8	00·0
May 1	103·6	104·0			

Experiment II.—By this experiment it was sought to determine whether the fluid contained in the eruptive vesicles had the power of producing typhoid fever by inoculation. The fluid employed was collected, on the 19th of April, from one of the pigs used in the preceding experiment. On the 15th of May, a healthy pig, about six months old, was inoculated from the charged ivory points already referred to. The operation was performed in the ordinary manner, as for vaccination, by simply scratching the skin very superficially, and wiping the charged points upon the excoriated surface. The part selected for the operation was the inner side of the thigh. Four points were employed upon the three separate scratchings.

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* This Table dates from the day prior to that of exposure.

May 16th.—The inoculated spots exhibit no efflorescence beyond what would be observed in an ordinary scratch.

17th.—The local signs of irritation are less marked than yesterday. There is no exudation from the scratches; indeed, the parts are quite dry.

18th.—The redness has almost entirely disappeared from the site of the inoculation, and there are no signs of constitutional disturbance.

19th.—The scabs from the places of inoculation are falling off, and the surrounding skin has resumed its normal colour. There was slight dulness towards evening; and the skin, which was cool in the morning, became hot.

20th.—The skin is intensely hot this morning: a diffused redness covers the belly, as well as the throat and the inside of the arms. Food is taken with indifference, but fluids are largely swallowed.

21st.—Dulness is much increased. On the belly six or seven raised spots of a red colour are visible. The efflorescence is more extensive and intense; behind the ears it is very marked, and also on the inner side of the thighs. Thirst is great, and food is almost entirely refused. The fæces are softer than they were yesterday; several evacuations have taken place during the day.

22nd.—On the inner side of the arms and thighs, and behind the ears, many red spots exist. Rigors are very decided, and a great desire for warmth is evinced. The eyes are congested and watery, and there is considerable prostration of strength.

23rd.—The spots first erupted are subsiding, and a dark red point, not unlike an ordinary flea-bite, is seen in the centre; a few fresh ones have appeared on the haunch and breast. The fæces are more consistent than when last referred to. Thirst is very great, and food is altogether refused. The body is emaciated, and the prostration increased.

24th.—The spots erupted on the 22nd are declining, and the epidermis covering them is raised in scales. In the centre of all the spots the flea-bite point is to be seen.

25th.—The eruption is rapidly disappearing, leaving behind a yellowish-brown stain. The fæces are firmer in consistence; and the animal appears to be better. The thirst is not so great, and a little food is taken occasionally. Towards evening the skin again became very hot.

26th.—Two or three fresh spots have appeared on the haunch;

a watery discharge issues from the eyes and nose, and the face wears a pained expression.

27th.—The bowels exhibit marked irritation; the evacuations are frequent, small in quantity, and of a yellowish-brown colour. The epidermis is desquamating from the seat of the eruption, and several fresh spots have been developed on the throat.

28th.—The countenance presents a stupid appearance; the movements are feeble and unsteady; the stools are liquid, and emit an offensive odour.

29th.—Prostration increased; the rigors are very severe, and the pulse is quick, small, and feeble. Towards evening large irregular patches of redness appeared on the belly and breast, and the diarrhœa became more severe.

30th.—A fresh crop of spots has appeared on the belly and about the ears. Diarrhœa is very acute. Pressure applied to the belly occasions pain; the eyes and nose discharge a puriform matter. Prostration is now very great, and the body is more emaciated.

31st.—Much the same as yesterday, excepting that the skin is less red, and the eruption has somewhat subsided.

June 1st.—The belly and breast are studded with petechiæ and blood-blotches of various sizes. The gait is rolling and unsteady, and a low continuous grunt is emitted with each expiration.

2nd.—A few fresh spots have appeared on the haunch and on the inner side of the arms and thighs; the epidermis of the ears and contiguous parts is broken, and stands out in thick brown scales; on being removed, a raw red surface is exposed. Altogether, however, the animal seems better, and its desire for water is less.

3rd.—The haunch is now more or less covered with vesicles,* some of which are confluent. Large layers of epidermis may be readily removed from the part. The ears are of a purple hue, and the cuticle is freely desquamating. The countenance is less expressive of pain, and the diarrhœa has somewhat abated.

4th.—The fæces are less fluid, and the animal has a decidedly better appearance. The discharge from the eyes and nose has nearly subsided; and, excepting the hæmorrhagic patches, the redness of the skin has almost disappeared.

5th.—The appetite is better this morning; the vesicles are drying up, and the entire surface of the skin is covered with thick and loose epidermic scales. The stools are, however, more fluid and fœtid than they have been since the attack.

6th.—Beyond slight twitchings of the muscles of the fore-limbs, there is no apparent change in the general condition of the animal.

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* Twenty-four "ivory points" were charged with the virus.

7th.—The head-symptoms are less severe; there is no disposition on the part of the animal, however, to leave its bed, even though moderate force is applied. The muscular twitchings are more marked and frequent, and rigors are provoked by the slightest exposure. The axillæ are intensely red.

8th.—Excepting that a few fresh hæmorrhagic spots have been developed in different parts of the skin, the symptoms are much the same as yesterday.

9th.—This morning the evacuations are involuntary; the stools are watery and very offensive. The abdomen is "tucked up," the back is arched, and the extremities are directed towards each other, as if to relax the abdominal muscles. The animal is extremely emaciated, and almost reduced to a skeleton.

10th.—The stools are deeply stained with blood; several small coagula, as well as some greyish-white masses of typhoid exudation, have been discharged during the day. The ears are uniformly purple, and very cold; they are covered with a thick layer of desquamating cuticle and dried exudation matter.

11th.—The abdomen is tumid, and very tender; otherwise the symptoms are much the same as yesterday.

12th.—More large blood-blotches have appeared on the sides. The ears are quite livid, and, around the border, exhibit a gangrenous condition. The abdominal pain is less shown on the application of pressure; but the general health is worse. The breathing is distinctly accelerated, and the emaciation continues to increase.

13th.—Gangrene of the ears is extending rapidly. The animal presents a pitiable aspect. The breathing is quick, and the bronchial sound harsh. There is likewise an occasional cough.

14th.—A large portion of both ears is circumscribed by a line of intense redness, and the sloughing process has fairly commenced. Food is taken sparingly; but there is no decided change in the general condition of the animal.

15th.—From this time to July 31st very slight progress towards recovery was made. Although now far advanced, the sloughing process in regard to the ears is not completed. The animal was destroyed.

Experiment III.—In order to place beyond all doubt that the disease in the pig last experimented on depended entirely on the inoculation with the virus, and was not the result of ordinary contagion, Mr. Axe had recourse to another experiment. To insure complete isolation from all known sources of infection, he availed himself of the services of Messrs. Priestman and Rayment—two gentlemen well known in connection with contagious diseases of animals. A pig was obtained from a healthy stock, and inoculated by Mr. Priestman on his own premises, on the 10th of June. Ivory points charged with the virus from the pig referred to in the last experiment were employed, and the mode of operating was the same as in the former case. The animal was kept some distance away from the College, which at that time was to be considered as an infected place; and it was not until the disease had become fully established that it was brought under Mr. Axe's care. Knowing the contagious nature of the malady, he had refrained from visiting it; and to the kindness of Messrs. Priestman and Rayment he is indebted for the following report of the progress of the disease.

June 14*th.*—Four of the teats are very red, and slightly swollen; towards evening the redness disappeared.

15*th.*—Surface of the body very hot; loss of appetite; tremors, and marked restlessness present.

16*th.*—The surface heat has subsided; a few red raised spots are to be seen on the belly, and on the inner side of the thighs; food is altogether refused; respiration somewhat increased. The animal lies on his side, and there is no disposition to move. In the evening the spots had nearly disappeared; a little food was partaken of; but the surface of the body again became hot.

17*th.*—More spots have appeared on the sides of the belly, in patchy groups. In the evening they declined somewhat, and were less distinctly seen.

18*th.*—The appetite has improved; tremors are still present; the fæces are hard, and covered with a little bloody mucus.

19*th.*—The surface temperature is slightly exalted.

20*th.*—No change.

21*st.*—No appetite; skin dry and scaly.

22*nd.*—Feeds a little; bowels still constipated.

From the last-mentioned date to the 6th of July, on which day the animal was brought to the College Infirmary, the general symptoms of illness underwent but little change. They were, however, associated with desquamation of cuticle from the entire surface of the body.

On the arrival of the animal at the Infirmary, Mr. Axe submitted it to a careful examination, and fully satisfied himself that the symptoms were those of enteric fever. The ears and haunch were marked by irregular patches of a deep purple hue. The eyes were congested, red, and watery; and the dirt which had accumulated around them indicated that this watery condition had existed for some time. The inner side of the thighs and arms, and the underpart of the belly were covered by loose desquamating epidermis. The ears were covered with thick, grey scabs, and the general mass of cuticle was being rapidly removed from the body. The countenance was haggard, and the gait feeble and unsteady. The extremities were cold; and the bowels constipated. The belly was tumid, and resonant on percussion. Pressure revealed some abdominal tenderness, but whether this arose from the tympanitic state of the belly, or from actual intestinal disease, could not be well determined.

7th.—All the symptoms observed yesterday are intensified; the abdomen is now distended to an enormous degree. The animal has a dull, confused, and stupid look; and convulsive twitchings of the muscles are present to a greater or less extent over the entire body.

8th.—The bowels are still constipated, and the tympany is undiminished; the nervous depression is aggravated. The animal obstinately refuses to move, even though pressed to do so. A peculiar groan is emitted when any attempt is made to disturb him.

9th.—This morning the animal is in a state of collapse. He died about noon.

Experiment IV.—This may be called a purely accidental experiment; nevertheless, it serves to illustrate the incubative period of the affection, and to determine its virulently contagious nature. The case also furnishes data as to the progress of the symptoms, and serves with the others to indicate the order of events as they occur during the fever process.

The animal which had been procured by Mr. Priestman for the purpose of being inoculated escaped from its house, and gained access to the pig used in Experiment III., on July 1st—twenty-one days after its inoculation. It was allowed to remain with the experimental pig until the 6th of July, when both of them were brought to the College. At this time infection was clearly established; and although the animal exhibited no marked signs of illness, a distinct eruption of raised, red spots existed on the breast, and on the inner side of the arms. The spots were not numerous, but isolated, and scattered over a large surface. The eyes were suffused, and slightly injected; food was taken freely, but there was considerable thirst.

July 7th.—The eruption has extended to the abdomen and the inner side of the thighs. In the last-named parts, the spots are numerous, and grouped together in confluent masses. The bowels are constipated, and the fæces coated with thick tenacious mucus. Towards evening there were violent paroxysms of shivering, and a great desire for warmth was manifested. On the spots erupted in the morning vesicles are developing, and the surface of the skin is moistened with exudation. The face is pinched, and presents a painful aspect.

8th.—The eyes are very red, and a watery discharge issues from them, and also from the nostrils. A pungent heat is felt over the entire surface of the skin. The spots are rapidly subsiding; the desire for water is much increased.

9th.—The spots have almost entirely disappeared, but the skin on the breast and ears is intensely red and hot. The fæces are still hard, and coated with mucus. The face has a dull and stupid expression, and the movements of the body, although regular, are, nevertheless, feeble.

10th.—The eruption has entirely subsided, leaving the skin freckled with yellowish-brown spots, and the cuticle raised and ragged. The seat of the eruption is spotted over with bluish-red points.

11th.—On the inner side of the thighs about half-a-dozen fresh spots have appeared, but otherwise there is a general remission of all the symptoms, and the animal is disposed to take food.

12th.—The discharge from the eyes is puriform, and the nasal flux is tinged with blood. The favourable change in the general symptoms recorded yesterday continues to-day.

13th.—This morning the animal looked more cheerful, and seemed altogether better. Towards evening, however, the skin became hot, and four small, irregular patches of a bright-red colour appeared about the umbilicus, and threatened a fresh outbreak of papules.

14th.—Half-a-dozen spots are now developed on the belly; the restlessness and irritability are very marked. There are no indications of pain on pressure being applied to the abdomen, but all the favourable symptoms of the past two days have passed away.

15th.—The body shows signs of emaciation, and the movements are feeble and unsteady. Although the general symptoms are not intensified, the prostration is more decided. No desire is evinced to move, even when an attempt is made to raise the animal.

16th.—The bowels are still constipated, and well-marked rigors are present. The spots are fast subsiding; but the tips of the ears and feet present a livid hue.

17th.—Beyond an extension of the discoloration of the ears there is no local change; the general condition of the animal is much the same.

18th.—A decided disposition to take food exists, and the desire for fluids is much diminished. The irritability and restlessness have almost entirely subsided, and there is an abatement in the severity of all the symptoms.

19th.—The favourable change of yesterday is continued to-day.

20th.—The skin is more cool, and the cuticle is desquamating over its entire surface. Thirst is less intense. The discharge from the eyes and nose has much diminished, and the confused and pained expression of the face has now almost disappeared. A little more food has been taken, and there is a marked improvement in the general state of the animal.

21st.—The bowels are relaxed, and the stools are of a dark brown hue. The skin of the haunch is studded with hæmorrhagic patches, and the belly exhibits a number of petechiæ. The desire for food has much increased, and the fever symptoms are on the wane.

22nd.—The stools are more fluid and frequent, and the bowels manifest signs of irritation. The general health, however, appears to be much better, and the thirst has declined.

23rd.—Blood-blotches of various sizes are now to be seen on the neck and about the ears. The bowels are more relaxed, and the emaciation continues; but the appetite is improved, and the general condition is decidedly more favourable.

From this date to August 14th the diarrhœa continued, with slight intermissions, and the wasting of the body gradually went on. The appetite was very variable, but no signs of acute suffering were evinced. From time to time the fæces were searched, but in vain, for typhoid sloughs; still there cannot be a doubt that ulceration of the intestine existed, though probably to only a slight extent.

PIG TYPHOID THERMOMETRICAL TABLE.*

EXPERIMENT II.

A.

Date.		Morning	Evening	Date.		Morning	Evening
May	15	103°·4	103°·6	June	2	104°·6	104°·8
,,	16	103·6	103·	,,	3	104·2	104·2
,,	17	104·	103·8	,,	4	104·	..
,,	18	103·	103·	,,	5	103 8	104·
,,	19	103·8	103·4	,,	6	103·8	103·8
,,	20	104·	107·	,,	7	104·4	..
,,	21	105·	106	,,	8	104·	105·
,,	22	104 8	105 4	,,	9	103 4	103·8
,,	23	103·4	105 2	,,	10	103·	104·
,,	24	104·6	106·	,,	11	..	..
,,	25	106·8	105·8	,,	12	..	103·4
,,	26	105·	106·	,,	13	104·4	104·6
,,	27	103 6	104·4	,,	14	103 4	103·
,,	28	105·2	106·8	,,	15	104·	105·
,,	29	104·2	106 6	,,	16	103·2	103·
,,	30	105·4	105·4	,,	17	103·6	105·2
,,	31	104·6	..	,,	18	103·6	..
June	1	104·6	105·	,,	19	104·4	..

* This Table dates from the day of inoculation.

PIG TYPHOID THERMOMETRICAL TABLE.

EXPERIMENT III.

Date	Morning.	Evening.	Date	Morning.	Evening.
	°	°		°	°
June 10*	..	103·	June 19	102·4	..
,, 11	..	103·	,, 20	104·8	..
,, 12	102·4	104·2	,, 21	106·	..
,, 13	102·6	..	,, 22	105·	104·8
,, 14	102 4	103·6	,, 23	103 6	104·8
,, 15	104·2	105·8	July 6	..	102·
,, 16	104·2	103·	,, 7	104·1	105 8
,, 17	104·6	105·4	,, 8	105·8	106·6
,, 18	102·	..	,, 9	105·	..

EXPERIMENT IV.

Date.	Morning.	Evening.	Date.	Morning.	Evening.
	°	°		°	°
July 6†	..	105·	July 19	104·	104·4
,, 7	105·8	105·6	,, 20	104·2	104·6
,, 8	105·8	106·	,, 21	104·	104·2
,, 9	105·	105·8	,, 22	103·6	104·
,, 10	105·2	105·8	,, 23	103·8	..
,, 11	105·8	106·	,, 24	103·	103·4
,, 12	104·	104·6	,, 25	103·	103·2
,, 13	104·	105·	,, 26	..	103·6
,, 14	105·	105 6	,, 27	103·	103·
,, 15	104·6	105·	,, 28	..	103·4
,, 16	105·	105·4	,, 29	103·	103·
,, 17	104·2	104·6	,, 30	102·8	103·
,, 18	104·	104·2	,, 31	102·6	102·8

Mr. Axe concludes his Report by observing, that the pathological lesions developed in the progress of this affection were seen chiefly in the intestinal canal. Here were found ulcerations of various extent, and not unfrequently in both the large and small intestines; the lymphatic glands, lungs, throat, and mouth were likewise more or less diseased, and the body generally was in a state of extreme emaciation.

CHEMICAL ANALYSES IN CASES OF SUPPOSED POISONING.

The following Report, on investigations which have been undertaken in the Laboratory of the College, has been supplied by Professor Tuson:—

"During the past year, very many cases of interest to the agriculturist have been investigated in the Laboratory of the College by myself and assistants. The most important have been cases of poisoning in the domesticated animals; and my experience leads me to the conclusion that both foxes and hounds are being destroyed more frequently than is generally supposed—the agent employed being occasionally arsenic, but in the majority of instances strychnia. That the latter agent is more commonly resorted to than any other for the destruction of animal life is to be accounted for, I believe, by the circumstance that strychnia—in the form of the so-called *Vermin Killers*—can be purchased with greater facility than any other poison. During the fifteen years I have held the Professorship of Chemistry in the Royal Veterinary College, I have investigated between five hundred and six hundred cases of actual poisoning or supposed poisoning in the lower animals; and in almost every instance in which I have detected strychnia in a dog or a fox, I have found the remains of a rabbit, hare, rat, or pheasant or other bird, in the animal's stomach; such rabbit, &c., having doubtless been charged with the poison and then used as a bait. I have likewise conducted, during the past year, many analyses of the viscera of cattle and sheep in which lead has been found; and, from inquiries made, it would appear that all of them have been cases of malicious or wilful poisoning—probably with acetate (sugar) of lead—for no evidence could be gained of the animals having had access to paint, water contaminated with lead, bullet-spray from rifle-butts, or to any of the other well-known accidental sources of lead-poisoning. I have likewise to record a case of the poisoning of two cows through drinking water from a brook which was polluted by drainage from a gas-work in the neighbourhood of London. The water, on being analysed, was found to be highly charged with sulphide of calcium, an exceedingly powerful irritant. As is well known, lime is used to remove the sulphuretted hydrogen from coal-gas; and in performing this office it becomes transformed into sulphide of calcium. After a certain time the purifier is discharged of its contents, which are allowed to remain exposed to the air in the yards of gas-works. Rain falling on them dissolves the sulphide of calcium; and, in the case now cited, the solution formed found its way into the brook.

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* Date of inoculation.

† Five days after inoculation.

"In the manufacture of sulphate of ammonia from gas-liquor, for manurial purposes, large volumes of highly noxious sulphuretted hydrogen gas are, in badly-arranged works, vomited into the atmosphere, which is not only prejudicial to surrounding vegetation, but is also prejudicial to the health of, and even fatal to, animals. In a recent inquiry in which I was professionally engaged, a varnish-maker, his family, and his horses, dogs, and fowls, had been living in Kent in perfect health for twenty years. About three years ago a sulphate of ammonia work was erected within a few yards of his residence and manufactory. Since that time, especially at night, sulphuretted hydrogen has been evolved in large quantities from the sulphate of ammonia works, and the family above referred to have suffered, more or less continuously, from nausea, fainting, diarrhœa, and the other well-known effects of sulphuretted hydrogen; all fowls die on his premises; one large Newfoundland dog, after exhibiting the symptoms of poisoning by this gas, died; and his horses have been more or less affected.

"In addition to the foregoing, I have examined several well-waters recently polluted with sewage and drainage; and the general and scientific evidence obtained proved that the sickness and mortality among farm-stock observed in connection with these cases have been occasioned by the drinking of the waters so contaminated.

"Among the cases of cattle-foods sent to me for analysis, I may refer to three, which were samples of rape-cake containing large quantities of charlock (wild mustard). The eating of these cakes by beasts, in three different counties, was followed by many deaths."

XI.—*Annual Report of the Consulting Chemist for* 1875.

By Dr. AUGUSTUS VOELCKER, F.R.S.

THE appended tabulated summary shows that the number of samples of feeding-stuffs, manures, soils, waters, &c., sent to me for analysis in 1875, by members of the Royal Agricultural Society, exceeded the number sent in 1874 by 59. As many as 704 analyses and accompanying Reports were sent by me to individual members of the Society during the period between December 1874 and December 1875. With the exception of the year 1871, in which an unusually large number of oilcakes were sent for examination, this is the largest number of analyses which have been made by me for members in a single year, as will be seen by the following returns for the years 1867–75:—

Number of Analyses made for Members of the Royal Agricultural Society.

1867	341	1872	657
1868	432	1873	670
1869	465	1874	645
1870	580	1875	704
1871	730		

The paper which I contributed to the 'Journal,' "On the Composition and Properties of Drinking Water, and Water used for general purposes," appears to have had the effect of directing the attention of country residents to the important and much-neglected subject of a wholesome water-supply for man and beast. An unprecedentedly large number (78) of samples of water were analysed by me in 1875 for members of the Society; and. as in previous years, a considerable proportion of them were found totally unfit for drinking purposes.

Occasionally, in the country, horses and cattle are supplied with water which partakes more of the character of liquid manure than that of spring- or wholesome well-water. Thus, quite recently, I had sent to me from Lincolnshire a specimen of water, which had been taken from a well, and had caused the death of two horses, one cow, and three beasts. Passing by the details of the analysis, I may observe that the smell of the water was extremely disgusting, and it was almost as much coloured as liquid manure. I found in it fully as much ammonia as in town-sewage, on an average, and a larger proportion of saline constituents. In point of fact, this well-water was rather concentrated sewage than water. It is scarcely necessary to say that such a filthy liquid unquestionably is unwholesome, and likely to produce all kinds of disorders. It is surprising that any person should have given such a liquid to horses or cows, for it was not ordinary well-water, but rather concentrated liquid manure, which ought to have been kept in the manure-heap, and not have been allowed to percolate into a neighbouring well, to the injury of the manure, and to the still more serious damage of the stock which was supplied with the contents of such a poisoned well.

In mining districts the water of brooks and streams not unfrequently becomes contaminated with metallic poisons. A case of water poisoned by lead was brought under my notice last June by a member of the Society residing in the neighbourhood of Matlock in Derbyshire, who wrote to me as follows:—

"I occupy some land through which a brook runs, and into this brook the refuse of some lead-smelting works is poured. The water of the brook is backed up in a kind of reservoir for the use of some bleaching-works further down the stream, and, in consequence, some of the scum from the lead-works becomes mixed with the water. I have lately lost a mare and foal; and several of my cattle have, from some cause or other, gone off very much in condition; and I am desirous of knowing whether the water in the brook is injurious and unfit for use."

The water sent for analysis was taken from the reservoir at Lea Bridge. The whole of the bottom of the reservoir, I was informed, is covered with a deposit, a sample of which was also sent for examination.

The analysis of the water showed that it contained soluble lead-compounds in appreciable quantities, and was totally unfit for drinking purposes; and much lead was found in the sediment at the bottom of the reservoir.

I have next to report a case of injury done to stock by ergotized grass, brought under my notice by Mr. Richard Garrett, Carleton Hall, Saxmundham, who wrote to me on the 28th of September, 1875:—

> MY DEAR SIR,—We have been having bullocks die on some of the marshes near here, without being able to discover the cause of death; one died last Saturday suddenly; it appeared to be healthy and well on Friday, and was found dead on Saturday.
>
> On careful examination, the stomach and intestines exhibited every symptom of having been poisoned.
>
> Carefully inspecting the marsh on which the bullock had been, a few stalks of grass were found with some excrescence, similar to ergot of rye, and some of the same kind of seeds could be seen in the stomach and paunch of the dead bullock.
>
> I enclose herewith a few of these grass seeds I allude to; I shall be glad if you will inform me if this is ergot, as, if it is, it will explain a great deal that has been a mystery to graziers in these parts for the last few months.
>
> Yours very truly,
>
> *To Dr. Voelcker.* RICHARD GARRETT.

The specimens sent by Mr. Garrett were readily recognised by me as ergot.*

I have frequently directed the attention of members to the indigestibility of the coarsely ground cotton-seed husks, which are often found in badly made whole-seed cotton-cakes, and the injury which such cakes do to stock, especially when fed upon dry food without a sufficient allowance of succulent food, such as roots or grass. Nevertheless, not a year passes in which I do not receive for examination samples of cotton-cake, alleged to be poisonous. In the past year, again, several instances of injury to stock by cotton-cake—one case terminating fatally—were brought under my notice. No poison, however, was detected in the cakes sent for analysis; and the injury which they undoubtedly did to cattle was clearly traced to the coarse condition and consequent indigestibility of the cotton-seed husks in them.

Decorticated cotton-cake, likewise, is rather indigestible, and should be broken up finer than is usual with linseed-cake. Better still it is to reduce the decorticated cotton-cake to powder, and to mix the meal, which contains as much as 40 to 41 per cent. of albuminous compounds, with Indian corn or rice-meal, or other farinaceous meals, comparatively poor in those nitrogenous compounds.

Cotton-cake meal is occasionally sent from America, and, if fresh and in good condition, is a useful and more handy concentrated food than cotton-cake. A sample of cotton-seed meal, sent to me last month by a member of the Society, on analysis, was found to contain, in 100 parts:—

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* For further information on this subject, see a paper, "On Ergot," by W. Carruthers, F.R.S., Consulting Botanist to the Society, in Vol. x., Part 2, page 443, of he second series of this 'Journal.'

Composition of a Sample of Cotton-seed Meal.

Moisture	8·61
Oil	12·57
*Albuminous compounds (flesh-forming matters)	43·12
Mucilage, sugar, and digestible fibre	24·86
Woody fibre (cellulose)	5·82
Mineral matter (ash)	5·02
	100·00
* Containing nitrogen	'6·90

The cotton-seed meal, apparently, was nothing but decorticated cotton-cake reduced to powder. It contained somewhat less oil than the best decorticated cotton-cake, but fully as high a percentage of albuminous compounds. One part of this cotton-seed meal and two or three of Indian corn, or one part of cotton-seed meal, one of Indian corn, and two of barley-meal, would make a cheap and very superior feeding-meal.

Hemp-seed cake is not often sold as such in the market. It is well known, however, to oilcake adulterators; being cheaper than linseed-cake and a wholesome feeding material, it is readily bought up for producing mixed or adulterated oilcakes.

A sample of hemp-cake, recently analysed by me, had the following composition:—

Composition of a Sample of Hemp-cake.

Moisture	10·57
Oil	11·17
*Albuminous compounds (flesh-forming matters)	29·56
Mucilage, sugar, and digestible fibre	18·03
Woody fibre (cellulose)	24·20
Mineral matter (ash)	6·47
	100·00
* Containing nitrogen	4·73

Hemp-cake is not equal to linseed-cake in feeding quality; but in my judgment it is worth more as an article of food than whole-seed cotton-cake. About 8*l.* 8*s.* per ton would be a fair price for hemp-cake of good quality.

I have also to report on a novel description of feeding-cake, produced by pressing into cakes the starchy and glutinous refuse fibre obtained in the manufacture of Indian corn-flour.

A maize-cake of that kind I found of the following composition:—

Composition of a Feeding-cake, being the compressed and dried starchy fibre which is produced in the manufacture of Corn-flour.

Moisture	13·46
Oil	5·01
*Albuminous compounds (flesh-forming matters)	11·06
Starch, mucilage, and digestible fibre	64·71
Indigestible woody fibre (cellulose)	4·96
Mineral matter (ash)	·80
	100·00
* Containing nitrogen	1·77

This cake contains a considerable proportion of oil, much starch and digestible fibre, with a fair amount of albuminous compounds. If it can be obtained at a moderate price, it may be given with advantage as an auxiliary food to fattening stock; but I would not recommend it for young growing animals.

A good food for fattening purposes is Sorghum-seed, which occasionally can be bought in the English market at a cheap rate. The following analyses represent the composition of two different varieties of seed, recently analysed by me:—

Composition of Two Varieties of Sorghum-seed.

	No 1.	.2.
Moisture	12·32	12·02
Oil	2·37	3·80
*Albuminous compounds (flesh-forming matters)	7·75	7·19
Starch, sugar, and digestible fibre	73·06	71·82
Woody fibre (cellulose)	3·20	3·50
Mineral matter (ash)	1·30	1·67
	100·00	100·00
* Containing nitrogen	1·24	1·15

Sorghum-seed is rich in starch, but rather poor in nitrogenous compounds. Ground into meal, and mixed with bean- or pea-meal, the mixed meal will be found a good, palatable, and cheap food.

Another article of food, recently examined by me, is a cake which is made in China from a species of oily bean. The following is the composition of this cake:—

Composition of Chinese Oil-Bean cake.

Moisture	8·30
Oil	6·67
*Albuminous compounds (flesh-forming matters)	39·25
Starch, gum, and digestible fibre	34·95
Woody fibre (cellulose)	5·03
Mineral matters (ash)	5·80
	100·00
* Containing nitrogen	6·28

It will be seen that the Chinese oil-bean cake contains about 6½ per cent. of oil and a very high percentage of albuminous or flesh-forming matters. Probably this is the kind of beans from which the Chinese make a peculiar kind of cheese.

Another novelty in feeding-stuffs is Liebig's prepared meat-powder, which has lately been recommended for pig-feeding. It is produced from the refuse meat-fibre, and parts of the carcase which are not used in the manufacture of extract of meat. In extracting the juice of meat, the larger proportion of the salts of potash contained in the meat pass into the extract, and the exhausted fibre becomes, to a great extent, indigestible. In order to remedy this defect, the late Baron Liebig advised the addition of phosphate of potash to the refuse-fibre. The following are the results which I obtained in the analysis of a sample of meat-powder, prepared in accordance with Baron Liebig's suggestion:—

Composition of a Sample of Prepared Meat Powder (Refuse Meat from the Manufacture of Extract of Meat).

Moisture		5·57
Fat		15·20
*Nitrogenous organic matter (chiefly fibrine)		74·62
†Mineral matter (ash)		4·61
		100·00
* Containing nitrogen		11·77
† Containing silica		0·55
Phosphate of lime		1·01
Alkaline salts		3·05
Including:—potash	·72	
chloride of sodium and	·99	
phosphoric acid	1·34	

With regard to the chemistry of soils, I have to report that as many as 43 samples of soils—a larger number than in any previous year—were sent to me by members of the Society, in 1875, for analysis and report. Amongst these were several samples of black Russian soils, known under the name of Tchernozem, and celebrated for their great natural fertility. I am making inquiries respecting the yield and producing power of these soils, and hope at some future time to publish the results of my investigation in connection with practical information respecting the management of the Russian black wheat and pasture land, about which I have made inquiries.

My attention has also been directed to the investigation of the cause of Anbury, or fingers-and-toes, which did much damage in certain districts in the past season; and I have traced the disease in a soil sent from Westmoreland to the deficiency of available potash and lime in the land upon which the turnip-crop was much affected by that disease

Some interest is attached to the earth from the site of abandoned dwellings and villages in Egypt. This earth, known in Egypt under the name of Sebah, and used for manuring purposes, as will be seen by the subjoined analysis, contains an appreciable amount of nitrate of potash and more phosphate of lime than usually occurs in the most fertile soils:—

Composition of Egyptian Nitre-earth, called Sebah, used as Manure.

Organic matter	5·25
Oxide of iron	5·31
Alumina	7·86
Sulphate of lime	1·05
Phosphate of lime	0·46
Carbonate of lime	3·06
Magnesia	1·60
Nitrate of potash	1·01
Chloride of sodium	1·42
Soda	·16
Potash	·79
Insoluble siliceous matter (clay and sand)	72·03
	100·00

Of the 50 samples of nitrate of soda sent for analysis in 1875, not one was found adulterated, and the larger number were first-class samples, containing from 95 to 96 per cent. of pure nitrate of soda.

Only four samples of potash-salts were received for analysis, which seems to imply that the use of potash-salts, as a rule, has not been found to be attended with much practical benefit.

The quality of the samples of Peruvian guano, sent by members in 1875, was fully equal to that of the samples received for analysis in the preceding year. They yielded, on an average, over 12 per cent. of ammonia. Dissolved Peruvian guano appears to have been used more extensively in 1875 than in the preceding year. All the samples sent for analysis were found up to the guarantee, and in a uniformly dry and finely powdered condition. As long as the Peruvian Government agents sell dissolved guano in a first-class dry and powdery state, equal to their guarantee, and at a fair price in comparison with the price of compound ammoniacal manures, I believe its consumption will increase from year to year.

Mixtures of superphosphate with nitrate of soda, as is well known, have been used with much advantage for cereal crops, especially for barley. There can be no doubt that, at the present unusually low price of nitrate of soda, such mixtures are cheaper than raw or dissolved Peruvian guano. It has to be borne in mind, however, that nitrate of soda is not retained by soils, like ammoniacal salts or nitrogenous organic matters; and for this reason it should not be applied to the land in autumn. It is not always desirable to delay the application of nitrogenous top-dressings to cereal crops until the spring. Hence good use, it appears to me, will continue to be made of Peruvian guano upon land and for crops which are best manured in autumn or during the winter months, whilst nitrate of soda is best applied to soils upon which cereals receive the greatest amount of benefit from the use of readily available nitrogen in spring top-dressings.

On naturally fertile clay-soils, and on heavy land in a fairly good agricultural condition, I believe nitrate of soda will be found a more economical application for cereal crops than Peruvian guano or ammoniacal top-dressings; but there are unquestionably a good many soils upon which the use of nitrate of soda is more or less hazardous. Very poor light soils are not only deficient in most of the elements of fertility which are required for the healthy and luxuriant growth of crops, but they also do not possess the power of absorbing and retaining nitrogenous manuring matters in the same degree as the heavier and better kinds of land.

In wet seasons nitrate of soda, when applied to light sandy soils, runs greater risk of being washed into the subsoil or of being carried off into the drains than ammoniacal salts or nitrogenous organic matters, or mixtures of both. It is safer, therefore, to apply upon such soils manures which, like farmyard-manure or Peruvian guano, have a far more complex composition than mixtures of superphosphate with nitrate of soda. In farmyard-manure and in guano we find not only soluble phosphates and nitrogen in one state of combination, but they also contain a number of saline mineral matters and a variety of organic compounds which do not occur in simple mixtures of superphosphate and nitrate of soda.

Thus Peruvian guano contains potash in appreciable quantities and in various states of combination, and the nitrogen in guano occurs partly in the shape of a number of ammonia salts, and partly as uric acid and other nitrogenous organic compounds, which are gradually resolved into plant-food on becoming incorporated with the soil.

The practical effect upon crops of complex manures, such as farmyard-manure or Peruvian guano, therefore, is more certain and more beneficial upon light soils than that of a simple mixture of superphosphate and nitrate of soda.

As yet none of the new deposits found in the south of Peru have been brought into the English market. If in future the quality of the new guano deposits should be found to vary to a greater extent than has been hitherto the case, it appears to me the door would be opened to fraudulent dealings if various kinds and qualities of Peruvian guano were put into the manure market.

The proper course for the contractors to pursue, I am inclined to think, would be to consign to the factories all cargoes which are too damp and lumpy to be applied to the land with advantage in a raw state, and to make arrangements in the different ports of importation for incorporating high and low quality guano, of a good friable character, into one fairly uniform bulk.

In my paper "On the Composition of Phosphatic Minerals used for Agricultural purposes," I stated that it is not desirable to apply any of these minerals, merely in a finely-powdered condition, to the land; and that all phosphatic minerals required to be thoroughly decomposed by sulphuric acid, in order to convert the insoluble phosphates into perfectly soluble compounds. I refer to these statements because parties interested in the sale of Redonda phosphate, a mineral composed of phosphate of alumina and some phosphate of iron, recommend the use of the phosphate merely in a powdered state, alleging that the application to the land of the finely-powdered raw phosphate has given satisfaction to agriculturists who have submitted this phosphate to the test of field-experiments. The history of artificial manures affords abundant evidence of the difficulty of ascertaining by so-called practical experiments the real value of manuring agents, especially if they are used in the shape of various mixtures; and it is well known that, like figures, field-experiments may be employed to prove almost anything that is desired.

The fact is that Redonda phosphate, like Alto Vela phosphate—another mineral chiefly composed of phosphate of alumina—cannot be employed as a raw material in the manufacture of superphosphate; and the extraction of phosphoric acid and the manufacture of alum from these minerals as yet has not proved to be much of a commercial success. Hence it is very natural for the importers and dealers in Redonda and Alto Vela phosphate to try to find a ready market for these minerals. Anybody at all acquainted with the true character of Alto Vela and Redonda phosphate, I am convinced, will support me in the opinion which I expressed in my paper, in opposition to the recommendations of the parties interested in the sale of these phosphates.

This, however, is not the first time that phosphate of alumina has been recommended to farmers.

I have before me a circular, issued in 1873, in which the Directors of a certain Company "desire to draw the particular attention of farmers, market-gardeners, and all parties interested in the sale of artificial manures, who may be desirous of obtaining high-class fertilisers at a moderate cost, to the phosphate of alumina, which they are now importing from the island of Alto Vela, in the West Indies, of which they have already a large stock in store for immediate delivery."

The same circular further states:—"The very small quantity of the Company's Alto Vela phosphate of alumina required per acre, in comparison with ordinary superphosphates, renders it at once a most economical manure, the first cost being much lower in price per ton, and producing an equally satisfactory result over a much larger area than is the case with any hitherto known artificial manure."

This phosphate is offered in a ground state, ready for immediate use, at 4*l.* 12*s.* 6*d.* per ton, and the reader of the preceding extracts from the Company's circular will not be surprised to find in it likewise the following paragraph:—"It may be confidently asserted that the Alto Vela phosphates, as manures for potato-crops, are unequalled. These phosphates will be found to be highly beneficial, not only as stimulating agents, but as preventives of the disease which has ruined these crops in recent seasons. For top-dressings for grass-crops very satisfactory results will be obtained."

The sum total which is annually lost by farmers in the purchase of all but practically useless fertilising materials, or artificial manures that are not nearly worth the price at which they are sold, if it could be ascertained, I doubt not would excite astonishment, and put a very serious aspect on the question of the value of unexhausted manures.

In illustration of the great variations in the real money-value and the actual price at which different artificial manures are sold, I beg to direct attention to the following analyses of three samples of artificial manures, which were sent to me last June by a member of the Society:—

Composition of Three Samples of Artificial Manure, marked No. 1, 2, and 3.

	No. 1.	**No. 2.**	**No. 3.**
Moisture	17·46	13·33	10·23
Water of combination and *organic matter	18·82	25·51	22·65
Biphosphate of lime (monobasic phosphate of lime)	4·97	6·45	18·91
Equal to bone-phosphate (tribasic phosphate of lime rendered soluble by acid)	(7·79)	(10·10)	(29·60)
Insoluble phosphates	7·29	17·60	12·05
Sulphate of lime, alkaline salts and magnesia ..	35·17	28·96	32·06
Insoluble siliceous matter	16·29	8·15	4·10
	100·00	100·00	100·00
* Containing nitrogen	·88	·68	1·66
Equal to ammonia	1·07	·83	2·02

The comparative money-value of these manures, according to the preceding analyses, is:—

	£	s.	
For No. 1.	4	0	per ton.
„ No. 2.	4	10	„
„ No. 3.	9	5	„

The price at which they were actually sold, delivered carriage paid at the nearest station, was;—

	£	s.	
No. 1.	7	10	per ton.
No. 2.	7	5	„
No. 3.	8	0	„

Thus No. 1 was sold at 3*l.* 10*s.* per ton above its real value, No. 2 at 2*l.* 15*s.* above its value, and No. 3 was cheap at 8*l.* per ton.

The following are the papers contributed by me to the pages of the March and September numbers of the 'Journal' for 1875:—

1. On the Composition and Properties of Drinking Water and Water used for general purposes.
2. Annual Chemical Report for 1874.
3. On the Composition of Phosphatic Minerals used for Agricultural purposes.

Analyses made for Members of the Royal Agricultural Society, from December 1874 *to December* 1875.

Guano	39
Superphosphate, dissolved bones, and compound artificial manures	190
Bone-dust	54
Nitrate of soda	50
Sulphate of ammonia	6
Potash-salts	4
Refuse-manures	25
Limestones, marls, ironstones, and other minerals	25
Soils	43
Waters	78
Sewage	3
Oilcakes	132
Feeding-cakes	13
Feeding-meals	14
Vegetable productions..	11
Bread	1
Examinations for poison	16
Total	704

Laboratory, 11, *Salisbury Square*, *Fleet Street*, *E.C*,,
December 1875.

XII.—*Annual Report of the Consulting Botanist for* 1875.

THE results of the experiments instituted by the Society, in connection with the potato competition of 1874, have been digested and arranged by me, and published as a Report in the recent number of the Society's 'Journal.' A short Paper, placing before the members of the Society the observations of W. G Smith, Esq., F.L.S., on some points in the history of the potato-fungus, was also written by me during the past year, and published in the 'Journal.'

Throughout the year I have carried on an extensive correspondence with members of the Society and others, in regard to these experiments and the nature of the disease which affects the potato. The whole subject has received fresh attention, and a better direction in the public press, through the action of the Society.

I have again supplied members who have applied to me with information regarding the general character, and especially the germinating powers of their different crop seeds.

My attention has been drawn by members of the Society to various diseases or injuries affecting their growing crops of wheat, oats, turnips, and potatoes, which have been investigated and reported upon. These various injuries were either already known and described; or the materials are yet too imperfect to permit of publication.

(Signed) W. Carruthers.

ADDITIONS TO THE LIBRARY IN 1875.

I.—PERIODICALS PRESENTED TO THE SOCIETY'S LIBRARY.

Presented by the respective Societies and Editors.

A.—English, American, and Colonial Periodicals.

Agricultural Economist. Vol. VI. 1875.
——— Gazette. Nos. 53–104. 1875.
American Agriculturist. Vol. XXXIV. 1875.
Athenæum (Journal). Nos. 2462–2513. 1875.

Bath and West of England Society, Journal of the. Vol. VII. 1875.
Bell's Weekly Messenger. Nos. 4072–4123. 1875.
Bristol Mercury. Vol. LXXXVI. 1875.
Bussey Institution, Bulletin of the. Parts I.-IV. 1874.

Chamber of Agriculture Journal. Vol. XI. 1875.
Country Gentleman's Magazine. Vol. XII. 1875.

Economist. Vol. XXXIII. 1875.
Essex Standard. Vol. XLV. 1875.

Farmer. Vols. XXIV. and XXV. 1875.
Farmer's Herald. Vol. XXI. 1875.
Field. Vols. XLV. and XLVI. 1875.

Geological Society, Journal of the. Vol. XXXI. 1875.
Goulding's Practical Farmer. Vol. I. 1875.

Highland and Agricultural Society of Scotland, Transactions of the. Vol. VII. 1875.

Institution of Civil Engineers, Proceedings of the. Vols. XXXIX.–XLII. Parts I.–IV. 1874–5.
Institution of Mechanical Engineers, Proceedings of the. 1875.
——— of Surveyors, Transactions of the. Vol. VII. 1875.
Investor's Monthly Manual. Vol. V. 1875.
Irish Farmer's Gazette. Vol. XXXIV. 1875.

Kankas, Third Annual Report of the Legislature of. 1874.

Live-stock Journal. Vols. I. and II. 1875.

Madras Presidency. Annual Report of the Superintendent of Government Farms. 1874.
Maine Board of Agriculture. Eighteenth Annual Report of the Secretary. 1873.
Mark Lane Express and Agricultural Journal. Vol. XLIV. 1875.
dland Counties' Herald. Vol. XXXIX. 1875.

Nature. Vols. XI. and XII. 1875.
Neilgherry District, Report on the Agricultural Condition of the. 1874.
New Haven. American Journal of Science and Arts. Vols. IX. and X. 1875.
New South Wales, Journal of the Agricultural Society of. 1875.
North British Agriculturist. Vol. XXVII. 1875.
North of England Farmer. Vols. X. and XI. 1875.

Ohio. Twenty-eighth Annual Report of the State Board of Agriculture for the year 1873.

Royal Asiatic Society, Journal of the Bombay Branch. 1873–4.
——————, Journal of the. Vol. VII. 1875.
Royal Geographical Society, Journal of the. Vol. XLIV. 1874.
——————, Proceedings of the. Vol. XIX. 1875.
Royal Institution of Great Britain, Proceedings of the. Vol. VII. Parts I.–VI. 1873–5.
Royal United Service Institution, Journal of the. Vol. XIX. 1875.

Smithsonian Institution. Annual Report of the Board of Regents. 1873.
——————. Contributions to Knowledge. Vol. XIX. 1874.
——————. Miscellaneous Collections. Vols. XI. and XII.
Society of Arts, Journal of the. Vol. XXIII. 1875.
Statistical Society, Journal of the. Vol. XXXVIII. Parts I.–IV. 1875.

Tasmania. Statistics of the Colony for the year 1874.

Veterinarian, The. Vol. XLVIII. 1875.
Virginia. School Report. 1874.

Washington. Report of the Commissioner of Agriculture. 1872–3.
Watford Natural History Society, Transactions of the. Vol. I. Parts I. and II.
Wisconsin Agricultural and Mechanical Association, Transactions of the Northern. 1870–3.
——— Academy, Transactions of the. Vol. II. 1873–4.

B.—Foreign Periodicals.

Berlin. Landwirthschaftliche Jahrbücher. Band III., Heft 1; Band III., Supplement; and Band IV., Heft 5. 1874 and 1785.
———. Landwirthschaftliches Centralblatt für Deutschland. XXIII. Jahrgang, Hefte 1, 4, 5, and 10. 1875.
Buenos Aires. Añales de la Sociedad rural Argentina. Vols. VIII. and IX. 1874–5.
Christiania. Anden Beretning om Ladegaardsöens Hovedgaard. Andet Hefte. 1875.
————. Beretning om den Höiere Landbrugsskole i Åas for Aaret 1872–73 and 1873–74. 1874 and 1875.
————. Tidsskrift for Landmænd. 1874 and 1875.
Leipzig. Central-Blatt für Agrikulturchemie und rationellen Wirthschafts-Betrieb. 2er Jahrgang, Heft 1. 1873.
Lisboa. Revista Agricola. Jornal da Real Associação Central da Agricultura Portugueza. 8° anno. 1875.
Munich. Landwirthschaftliche Verein in Bayern. Zeitschrift. 64ter Jahrgang. 1874.
Paris. Annales Agronomiques. Tome premier. Fasc. 1 and 4. 1875.
——. Journal d'Agriculture pratique. Vols. I. and II. 1875.
——. Journal de l'Agriculture. Vols. I.–IV. 1875.
——. Société des Agriculteurs de France. Bulletin Mensuel. 7^{me} Année. Vol. VII. 1875.
——. ————. Bulletin des Seances. 3^{me} Série. Vol. IX. 1874.

II.—BOOKS PRESENTED TO THE SOCIETY'S LIBRARY.

FOREIGN BOOKS AND PAMPHLETS.

Anon. Atlas Pecuario de Portugal. *Presented by the Portuguese Minister of Public Works.*

——. Recensamento Geral dos Gados no Continente do Reino de Portugal em 1870. 1873. *Presented by the Portuguese Minister of Public Works.*

——. Relatorio do Conselho Especial de Veterinaria. Lisbon, 1873. *Presented by the Portuguese Minister of Public Works.*

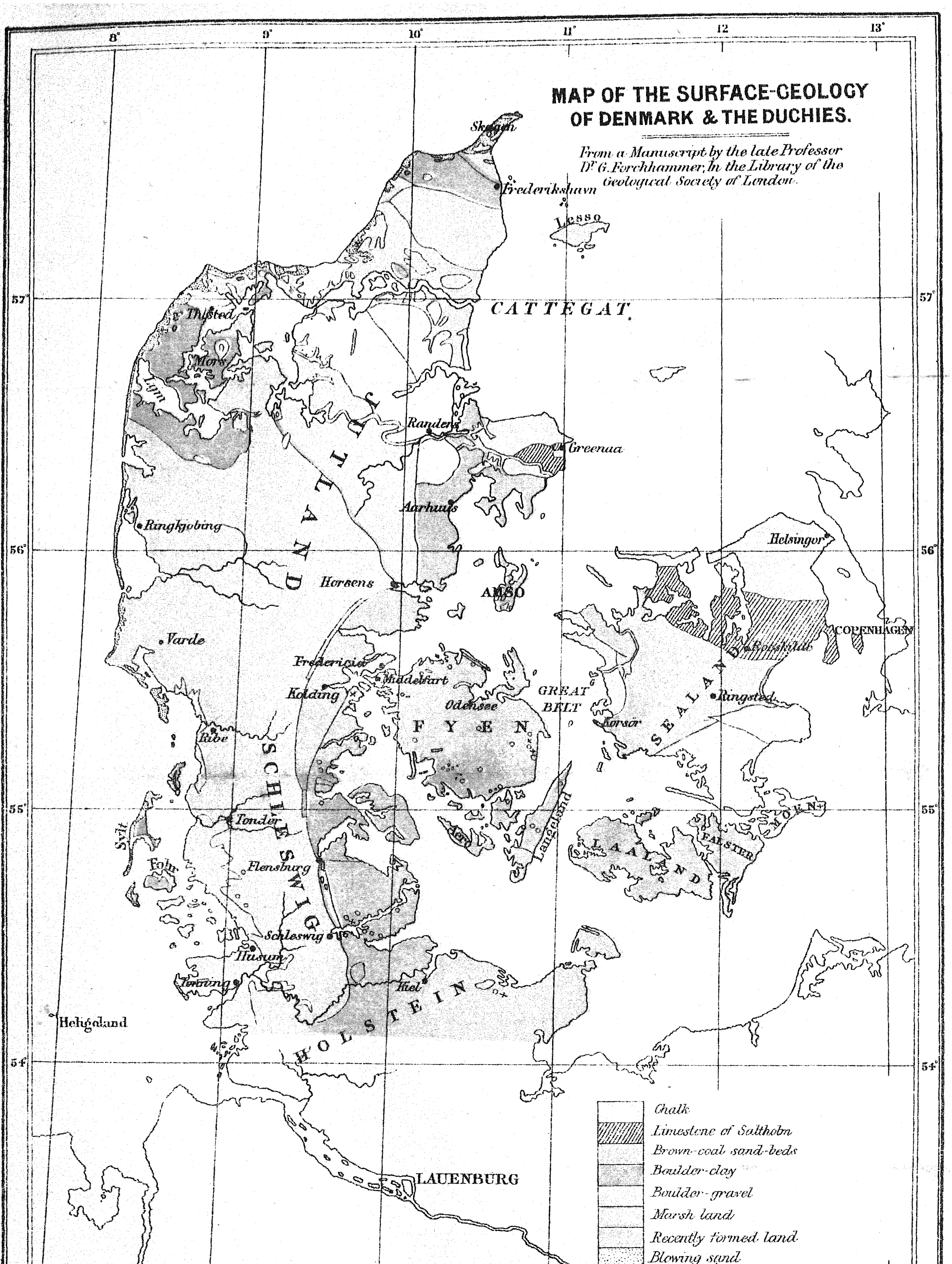
Lecouteux, E. Culture et ensilage du Maïs-Fourrage. Paris, 1875.

Schweinfurth, G. Discours prononcé au Caire à la séance d'inauguration de la Société Khédiviale de Géographie. Alexandria, 1875.

Smitt, J. Det norske Landbrugs Historie. Christiania, 1874.

Thesen, O. Om Dyrskuer og Udstillingsdyr. Christiania, 1874.

Trehonnais, F. R. de la. Le Touquet, histoire d'une forêt. Paris, 1875.



MAP OF THE SURFACE-GEOLOGY OF DENMARK & THE DUCHIES.

From a Manuscript by the late Professor Dr. G. Forchhammer, in the Library of the Geological Society of London.

Dangerfield Lith 22 Bedford St. Covent Garden.

JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY

OF ENGLAND.

XIII.—*Report on the Agriculture of the Kingdom of Denmark, with a Note on the Farming of the Duchies of Schleswig and Holstein.* By H. M. Jenkins, F.G.S., Secretary of the Society.

[With a Map.]

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Introduction.

In the introductory remarks to my "Report on the Agriculture of Sweden and Norway," I observed that the agriculture of the Scandinavian peninsula had not yet been described in the English language. This cannot be said of Denmark, for not only was an interesting account of an agricultural tour in that country, by Mr. J. F. W. Johnston, published in this 'Journal'* so long ago as 1842, but a valuable Paper "On the Past and Present State of the Agriculture of the Danish Monarchy," by Mr. Rainals, then British Vice-Consul at Copenhagen, was reprinted with the sanction of the Foreign Office in the volume for 1860.† The British Government has also more recently published two very instructive Blue-books, containing memoirs on portions of the subject, viz., Professor Wilson's Report on the Agricultural Exhibition at Aarhuus in 1867, and Mr. Strachey's Report on the Tenure of Land in Denmark, in 1870.[*] Portions of Professor Wilson's Report were republished in the volumes of this 'Journal'[†] for 1867 and 1868. Denmark should be, therefore, by no means a *terra incognita* to the English farmer.

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* 'Journal of the Royal Agricultural Society,' vol. iii., pp. 100–421.

† Ibid., vol. xxi., pp. 267–328.

The interest which the agriculture of Denmark has evoked of late years has not, however, been confined to England, for in 1863 the French Government deputed M. Tisserand to attend the Agricultural Exhibition held in that year at Odense; and two years afterwards it published an exhaustive Report, by that eminent writer, on the agriculture of the monarchy, as well as of Schleswig and Holstein,[‡] to which I shall have frequent occasion to refer. Still more recently, three German gentlemen have made an agricultural tour in Denmark, and some parts of Sweden and Finland (two of them in an official capacity), and last year (1875) published their Report, which has special reference to the dairy-husbandry of those countries.[§]

It will thus be seen that Danish agriculture possesses features which have been deemed worthy of study and description alike by English, French, and German officials; and in all probability by writers on agriculture in the remaining nations of Northern Europe. My endeavour will be to place before the readers of this 'Journal' such a description of the present state of agriculture in Denmark as will show what advances have been made since the date of Mr. Rainals' survey of the subject, especially in those features which are most important to the Danish farmer and most instructive to ourselves. Instruction, however, does not necessarily suggest imitation; and, in fact, the only points in which the best Danish farmers seemed to me in advance of ourselves were their butter-manufacture and their book-keeping. The Danish Government can take credit to itself for having made the dairy-farming of their country eminent, if not preeminent, in Europe, chiefly through the intelligent initiative of Professor Segelcke, aided by the practical skill of Mr. Friis, who first put his colleague's principles to proof on his farm at Lillerup, near Horsens.

THE LAND LAWS.

The leading features of the laws bearing on the ownership and occupation of land in Denmark must be briefly described, to enable the reader to understand the characteristics of the agriculture of the country. And, first of all, as to the unit of measurement. In England we have the *acre*, in France and Belgium there is the *hectare*, and in Germany the *morgen:* all measures of a larger or smaller extent of land-surface. But in Denmark, although there is a superficial land-measure, known as a *tönde*, equal to about 1⅓ acre, yet it is not used as a basis of taxation or in matters of law, except in combination with its estimated productive power in terms of another *tonde*, which is a corn-measure equal to 3⅓ bushels. In other words, all legislative enactments relating to the land, whether for purposes of taxation, or for those other objects which will be presently adverted to, take into account not only the extent of the land, but also its producing power, or rather its "natural fertility," as it was estimated in 1840, when the scale now in use was arranged.

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[*] Part I. of the 'Reports of Her Majesty's Representatives respecting the Tenure of Land in the several Countries of Europe, 1869.' Published in 1870.

[†] 'Journal of the Royal Agricultural Society,' Second Series, vol. iii., pp. 536–551; and vol. iv., pp. 312–320.

[‡] 'Études économiques sur le Danemark, le Holstein, et le Slesvig.' Paris, 1865. 4to., 190 pp. and 13 plates.

[§] 'Studien über das Molkereiwesen: Reiseskizzen aus Dänemark, Schweden und Finnland.' By C. Petersen, C. Boysen, and Dr. W. Fleischmann. Danzic, 1875, 162 pp.

For administrative purposes the quality of the land has been reckoned in hard-corn, viz. barley and rye,* in contradistinction to "soft-corn," such as oats; therefore, instead of speaking, as we do, of so many acres of land having a rateable value of so much per acre, it is usual in Denmark to speak of so many tönder-land taxed at so many tönder of hard-corn. In reality the tönde of hard-corn is simply the quantity of corn which represents the basis of the land-tax, the assessment having been made upon its average production, as ascertained in the year 1840; and all other rates and taxes are assessed on the same basis. The several qualities of land have been divided into twenty-five classes, commencing with No. 0 as the worst, or worthless, land, and ending with No. 24, as the best soil in the kingdom.

The land-tax is assessed upon 1 tönde of hard-corn for every 6 tönder-land of the best quality of soil; and the nature of the gradation between the qualities is shown by the taxation of the medium quality being 1 tönde of hard-corn for every 12 tönder-land of surface. In English this would represent an assessment upon one bushel of corn for every 4 acres of medium land, or 2 acres of the best land; and the average for the whole country, according to Professor Wilson, is upon 1 tönde of hard-corn for each 20 tönder-land of occupied surface, or, in other words, upon 1 bushel of corn for about 7 acres of land. It must be understood, however, that neither the land-tax nor any other charges on the land are now paid in corn, the quantity of hard-corn being what we should term the "rateable value." It will be seen, on p. 332, that the Crown taxes amount to about 1*l.* 2*s.* 6*d.* per tönde of hard-corn. The local taxes vary in different parishes, for reasons similar to those which cause variations in the burden of local taxation in England.

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* Wheat was not cultivated as a farm-crop when this basis of taxation was arranged.

The equitable assessment of the land is not the only, and in some respects not the chief, purpose to which the hard-corn classification is applied. Indeed, with regard to the cultivation of the land, its influence is more felt in the determination of the maximum and minimum areas of tenemental land which landowners are respectively permitted by the law to let in one farm, and tenant-farmers to cultivate. The national system of land-occupation will be best understood if I commence its description by stating that an owner of land in Denmark is not an absolute possessor of it, his possession being subject to certain legal restrictions as to the use to which he may devote his property.

Taking as a type a landed estate such as Englishmen are familiar with, having its home-farm and park adjacent to the mansion of the owner, and surrounded more or less by farms held by tenants, it will be instructive to describe the condition of such an estate in Denmark. The home-farm (Hovedgaard) is subject to different laws than those which affect the tenemental estate; it cannot be enlarged, except as a compensation for the sale of part of the tenemental estate, and although it may be let to a tenant under special agreement (generally on lease for eight or ten, or even twelve or fifteen years, at rents usually varying between 25*s.* and 30*s.* per acre, rising occasionally to rather more for better land), no portion of it may be exchanged for other land which has hitherto been tenemental, for the purpose of altering the area of the home-farm, until after the tenemental land has been vacant for a year and fourteen days. The tenemental lands must be let under certain conditions in areas assessed at not less than 1 tönde of hard-corn, and not more than 12 (equal to a minimum of 12 and a maximum of 144 tönder-land of medium soil, or from 16 to 192 acres).

The tenemental lands (or Böndergaarde) are let, within the limits of hard-corn just mentioned, on a lease for fifty years, or to the tenant for the term of his own life and that of his widow, if he leaves one. If the land is not entailed, the proprietor may sell such farms; but even then they may not be otherwise let by the new freeholder until after the expiration of twenty years from the time of purchase.

The tenants of both Hovedgaarde and Böndergaarde pay rent, not only for the use of the lands and buildings, but also for that of the live and dead stock, under certain conditions providing for their due maintenance. I went over a home-farm (Hovedgaard) of about 850 acres, near Randers, which is let to a tenant at a yearly rent of 3000 bushels of barley and 450*l.* in money, the landlord finding 160 out of the 180 cows which are kept on the farm. The landlord has the right, personally or by his agent, to select the calves which are to be kept to replace the cast cows; but in practice this right is not often exercised, and the tenant, being often a man of small capital, has a direct encouragement to sell those calves which will bring him the largest immediate return. For his own security the landlord generally stipulates for the payment of a year's rent in advance; and, as a rule, this leaves the tenant with no more than another year's rent as working capital. It needs no explanation to convince English farmers that this system is unfavourable to the improvement of the live stock of the farm, and to the introduction of improved machinery.

The law of Denmark also makes special provision for the encouragement of peasant proprietorship; and with this view it facilitates the sale of entailed estates, under certain regulations for the investment of the proceeds as trust-money; and further, a proprietor who sells tenemental land to the occupiers or their heirs, has the power (subject to the restrictions as to the size and individuality of farms) to add one-ninth the amount of land—*i.e.* tönder of hard-corn—thus sold to his home-farm, if he wishes it. Many tenants have therefore, of late years, become the owners of their farms, often by obtaining a large proportion of the purchase-money on mortgage from the original proprietor. Official statistics show that the average price of land in the monarchy during the ten years 1860–69 was 225*l.* per tönde of hard-corn. In the last of those years (1869) the average price in Jutland was 258*l.*, and in the Islands 365*l.*, the average for the kingdom being 296*l.* per tönde of hard-corn. In 1875 the registered prices had increased to an average of 395*l.* for Jutland, 472*l.* for the Islands, and 427*l.* for the whole kingdom, or an average increase of 44 per cent. in six years. Although land is generally bought and sold by the tönde of hard-corn, probably I shall not be far wrong in quoting 30*l.* to 40*l.* per acre as an average price for average land in Denmark at the present time, except in the case of very small farms, or those having exceptional advantages, for which an additional 10*l.* per acre might be obtained.

Smaller than the peasant-farms, and subject to special laws, are the plots of land, with houses attached, which are rented by the huusmand, or agricultural labourer. The quantity of land attached to each of these houses must not exceed 1 tönde of hard-corn, and the conditions of tenure are matters of agreement between owner and occupier. The lease or agreement must be in writing, or in default the presumption of law is that there is a lease for two lives. The lease must not contain any stipulation for services of work in payment of rent, wholly or in part; but a separate arrangement, unconnected with the tenure of the house and the land, may be entered into by the landlord and his tenant, provided that it is not for more than one year. As an encouragement to the provision of these small labourers' holdings, the law permits the landlord to parcel out peasant-farms for that purpose. It also permits him to convert peasant-farms into plantations, provided he builds two houses for labourers, and gives each a suitable plot of land for each farm so planted. Notwithstanding these encouragements to the settlement of agricultural labourers in the rural districts, it will be seen, in the course of this Report, that the scarcity of labour in those parts of Denmark where agriculture comes into competition with commerce is, in consequence of the want of improved machinery, a serious obstacle to the further development of Danish farming.

STATISTICS.

The area of the kingdom of Denmark, comprising the peninsula of Jutland, and the islands of Sealand, Fyen, Laaland, Falster, Langeland, and some smaller isles, is nearly 7 millions of Danish tönder-land, or about 9¼ million acres. Of this extent of land nearly 2½ millions of English acres are annually sown with corn-crops, and not more than 350,000 acres are occupied with all kinds of pulse- and root-crops. The grass-land under rotation, in permanent pasture and in common grass, together amounts to nearly 3 million acres, while nearly half a million acres are annually in bare fallow.

The annexed Table (I., p. 315) gives the details of the distribution of the land under the several crops in the different parts of the kingdom, while Table II. (p. 316) shows the distribution of landed property into large and small estates.

An analysis of the latter Table gives the following as the average extent of each class of property and occupation in tönder of hard-corn:—

	Sealand, Moen, and Samsø.	Laaland and Falster.	Bornholm.	Fyen, Langeland, and Æroe	Jutland.	Total Average
Estates of 12 tönder hard-corn and upwards	29·4	35·86	16·6	30·	23·22	27·47
Of 1 to 12 tönder	5·1	5·	4·6	4·27	3·25	3·86
Estates farmed by owner or on ordinary lease	5·7	6·2	4·75	5·	3·62	4·42
Farms held on Life-lease	5·1	6·	..	5·	4·1	4·93

TABLE I.—Showing the AMOUNT of CULTIVATED and FOREST LAND, and the NUMBER of HEAD of LIVE STOCK in DENMARK, in the Year 1871.

	Copenhagen.	Sealand, Mœn, and Samsø.	Laaland and Falster.	Bornholm.	Fyen, Langeland, and Ærœ.	Jutland	Total.
Total area of the Kingdom (including lakes) in Danish tönder (1⅓ imp. acre)	2,391	1,329,631	301,025	105,845	617,784	4,578,646	6 935,322
Land sown (in Danish tönder) with—							
Wheat	59	38,967	25,291	2,733	19,361	16,677	103,088
Rye	203	101,083	13,603	7,925	54,711	271,761	449,286
Barley	172	189,012	46,081	7,503	83,343	225,676	551,787
Oats	95	139,012	17,519	12,077	69,007	434,538	672,218
Buckwheat	..	765	8	38	2,722	32,613	36,146
							1,812,555
Peas and the like	9	31,166	11,921	2,747	8,930	9,520	64,293
Mixed (for provender)	73	38,441	9,857	1,580	25,727	23,305	98,983
Potatoes	36	20,428	1,510	2,100	6,701	46,989	77,854
Beet, turnips, &c.	53	4,629	626	135	1,206	3,554	10,203
Rape-seed	1	762	50	91	1,371	875	3,150
Industrial plants	2	3,654	593	192	3,576	6,132	14,119
Total	703	492,574	147,503	127,059	211,708	1,071,640	2,081,187
Meadow, pasture, and fallow land	658	510,174	119,648	36,080	246,978	1,709,798	2,623,336*
Woods and forests	..	126,141	32,289	10,173	36,253	114,206	319,102
General Total	1,361	1,201,274	278,996	83,461	559,886	2,895,614	5,023,625
Total extent of drained land	26	136,853	33,037	8,295	64,551	120,766	363,528
Live Stock—							
Horses	4,034	94,368	22,010	7,232	15,852	143,074	316,570
Cattle	2,682	289,689	55,407	20,337	152,210	718,543	1,238,898
Sheep	792	301,620	107,888	28,391	187,358	1,216,432	1,842,481
Swine	1,549	160,872	25,157	7,506	58,098	189,239	442,421

* Of this total, about 47¼ per cent. was pasture, 9¼ per cent seeds mown, 13 per cent. bare fallow, 3⅓ per cent. half-fallow, 15¾ per cent meadow, and 11¹ per cent. common grass.

TABLE II.—Showing the NUMBER of ESTATES of each CLASS, and the TÖNDER HARD-CORN at which each CLASS are assessed, in the several DIVISIONS of the KINGDOM of DENMARK.

	Sealand, Möen, and Samsö		Laaland and Falster.		Bornholm.		Fyen, Langeland, and Ærøe.		Jutland.		Total	
	Number.	Tönder Hard corn.	Number.	Tönder Hard corn.	Number.	Tönder Hard-corn	Number.	Tönder Hard-corn	Number.	Tönder Hard corn.	Number.	Tönder Hard corn.
Estates of the value of 12 tönder of hard-corn and upwards	669	19,664	169	6,061	12	200	291	8,759	787	18,288	1,928	52,972
Of 1 to 12 tönder	17,371	88,877	1,189	20,875	987	4,538	9,963	42,562	39,360	127,924	71,873	277,776
Of less than 1 tönder ..	37,182	9,978	9,085	2,580	1,817	673	21,007	6,024	63,415	20,218	132,836	39,173
Land not built on, but classed (cadastré) ..	..	1,998	..	191	..	139	..	541	..	1,102	..	4,574
Total	55,525	113,517	13,443	30,007	2,816	5,550	31,261	57,889	103,592	167,832	206,637	374,795
Houses without land ..	7,786	..	1,297	..	1,373	..	2,705	..	19,414	..	32,575	..
Mode of working—												
Estates of 1 tönde land and above, farmed by owner himself, or by holding on ordinary lease	11,182	83,299	3,755	23,328	999	4,738	7,408	37,037	38,326	138,734	61,970	287,136
By the Life-lease ..	3,561	18,212	603	3,608	..	..	2,846	14,284	1,821	7,478	8,831	43,612

The figures in this Table indicate with tolerable accuracy the relative quality of the land in the several divisions of the Danish monarchy. Laaland and Falster are the most fertile portions of the kingdom, and in those islands the average number of tönder hard-corn at which estates are assessed is the greatest; while in Jutland, where there is a large quantity of poor land, the average number of tönder hard-corn to each class of estate is the least, with the exception of the small island of Bornholm.

Export Trade in Agricultural Products.—The attention which has recently been given to Danish agriculture has probably arisen from the expansion which the export trade of the country in agricultural products has acquired of late years. It is only when people interested in agriculture find that the cattle, sheep, and pigs, the butter and other productions of a country, are competing with their own as staple commodities on their best markets, that they stop to inquire what are the essential features of the agriculture of that country. A glance at the annexed Table (III., p. 318) will show that during the five years 1870–74, the export of cattle has increased 50 per cent.; that of sheep has increased five-fold, and of pigs nearly nine-fold. The export of butter has doubled, and that of lard and grease has increased five times; while the trade in eggs has almost been created within that short time, having developed from a little over 30,000 score to nearly a million and a half of score, or fifty-fold. These comparisons are very startling; and their importance is in no respect diminished by the fact that the export of corn, meal, and dead meat, is nearly stationary, subject only to such fluctuations as are due to seasons; or that the export of cheese, which was always insignificant, has recently dwindled to nearly one-half of its former proportions. In fact, these statistics show, clearly and distinctly, that the Danish farmer has of late years made more and more use of the knowledge which he has gradually acquired from Professor Segelcke and his associates, and which amounts to this: all the world—America, Australia, and Russia in particular—can compete with him in producing corn; but not one of them can produce such butter, nor even such cattle, sheep, and pigs, on the markets where the best articles, in the best condition, command the best price. In the course of this Report it will be seen that these considerations are given their due weight by the best farmers in Denmark, and that their energies are chiefly devoted to supplying England and Hamburg with these high-priced commodities.

The extent to which the trade with England is direct may be judged by the following statement of the imports of the prin-

TABLE III.—EXPORTS of AGRICULTURAL PRODUCE from DENMARK in the FIVE YEARS, 1870–71.

	Number, Weight, and Measure.	EXPORTED IN					
		1870.	1871.	1872.	1873.	1874.	1874. In English Weights and Measures
Horses	Number.	8,850	22,810	12,476	11,385	7,088	7,088
Cattle	,,	47,293	45,139	50,316	64,765	71,256	71,256
Sheep, &c.	,,	8,651	7,862	21,038	39,099	46,396	46,396
Swine	,,	22,688	24,873	69,673	149,485	188,406	148,306
Other animals	,,	42,364	100,110	110,459	173,086	157,356	157,356
Meat, fresh and salted.. ..	Danish lbs	11,008,570	18,741,745	15,036,910	11,283,913	11,125,925	141,680 cwts
Lard and grease	,,	271,778	347,309	582,103	808,741	1,255,718	12 320 ,,
Butter	Barrel.	55,909	67,984	64,415	94,614	103,322	230,625 ,,
Cheese	Danish lbs	45,772	36,380	23,781	32,485	26,358	259 ,,
Eggs	Score.	32,270	56,052	339,529	689,539	1,126,902	1,426,902 sc
Buckwheat	Tonde.	344	3,007	5,277	8,821	3,920	15,000 bush
Barley	,,	1,187,551	1,577,654	1,204,055	1,334,534	1,001,969	3,831,535 ,,
Peas, beans, &c	,,	30,919	23,596	51,971	26,043	26,634	101,928 ,,
Oats .. , ...	,,	458,589	831,617	473,518	864,538	575,408	2,202,056 ,,
Wheat	,,	441,066	494,779	623,922	446,538	361,840	1,381,761 ,,
Maize	,,	275	..	.	..	..	.
Malt	,,	13,277	2,797	3,129	4,094	7,351	28,132 ,,
Rye..	,,	327,610	512,220	648,390	677,502	390,065	1,492,779 ,,
Tares, vetches, &c.	,,	710	2,231	2,352	5,003	1,653	6,326 ,,
Total ..	..	2,460,401	3,477,901	3,012,614	3,367,073	2,368,840	9,065,547 ,,
Flour and meal—							
Buckwheat	Danish lbs	53,743	79,919	90,006	107,651	254,322	2,293 cwts
Barley	,,	4,713,114	6,292,221	8,106,942	7,130,320	6,308,421	61,958 ,,
Beans, peas, and the like	,,	825	2,160	14,059	2,495	7,800	77 ,,
Oats	,,	21,765	102,261	11,163	15,166	36,701	360 ,,
Wheat .. ,.	,,	13,447,370	44,883,509	23,344,947	40,842,316	49,510,702	486,266 ,,
Maize	,,	..	5,400	..	8	..	,,
Malt	,,	7,821	8,456	11,255	12,600	12,840	126 ,,
Rye	,,	14,600,235	11,165,522	12,460,311	14,424,649	13,824,151	135,773 ,,
Total ..	..	62,844,813	62,857,448	44,038,483	62,535,207	69,954,940	686,853 ,,
Other preparations of flour	..	1,714,058	1,659,292	1,606,978	1,982,540	1,657,077	16,278 ,,

cipal agricultural articles from Denmark into the United Kingdom during the same five years, 1870-74:—

	1870	1871.	1872.	1873	1874.
Horses	991	1,298	2,634	3,044	174
Cattle	8,063	16,411	18,307	27,630	26,800
Sheep	6,388	13,402	17,249	20,331	14,456
Pigs	1,286	3,018	700	7,099	7,330
Butter, cwts.	127.013	140,851	173,574	201,553	226,053

The agricultural significance of the indirect trade arises from the fact that many of the Danish cattle which are exported are finished off on the marshes of Holstein. Coming to us from Hamburg or Tönning, they figure as German cattle, although they are, to all intents and purposes, of Danish origin and nurture. The Danes are very anxious to alter this state of affairs, and to send their own produce from their own ports.* Hitherto, the difficulty has been to construct and maintain a port on the west side of Jutland; but last year the port of Esbjerg was opened for traffic, as well as a railway connecting it with the rest of the kingdom by way of Lunderskov, near Kolding. By means of this port it is hoped that the direct trade between Denmark and England will be enormously increased, while on the other hand it is feared that Esbjerg will share the fate of other such attempts by the port becoming silted up.

However, notwithstanding the difficulties which have so long existed, the direct export of cattle to England has trebled in five years; that of sheep has fluctuated, but on the whole made similar progress; while the export of butter has been doubled. In 1870, Danish cattle formed not quite 4 per cent. of our total foreign supply, while in 1874 they amounted to nearly 14 per cent.†

PHYSICAL FEATURES.

The physical features of Denmark require but a brief description for the purposes of this Report; especially as they are so well illustrated by the map of the surface-geology of Denmark and the Duchies, which I am enabled to give through the kindness of the Council of the Geological Society of London. The original map is a manuscript, which was presented to the Geological Society by its author, the late Dr. Forchhammer, many years ago. I have reduced the scale, and generalised the geological features, so as to render it more intelligible to agriculturists who are not thoroughly conversant with the refinements of geological classification; but in all essential respects I believe it to be a faithful reproduction of the original manuscript drawn up by the distinguished Danish geologist.

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* With respect to Hamburg there is a valid economical reason for this desire, irrespective of the cost of transit, as cattle from that port are subject to more stringent regulations in Great Britain than those from Denmark or the Duchies. On this point see pp. 361 and 362.

† See 'Report of the Veterinary Department for the year 1874,' Appendix, Table XLII., p. 91.

The subsoil of Central Sealand, of Fyen and the other Danish islands (with the exception of Moen and Lesso), and that of the eastern side of the Cimbrian peninsula, consists of a marly clay, of glacial origin, containing large boulders, and known as "Boulder-clay." It is very similar to the deposits of that character which I noticed last year in my "Report on the Agriculture of Sweden and Norway." The surface of this deposit is undulated, and in the Duchies of Schleswig and Holstein, as well as in the south of Jutland and the islands, the country is well wooded, the favourite tree being the beech, of which very fine specimens are to be found in many of the parks belonging to large landowners. The western coast of the peninsula, from the mouth of the Elbe to beyond Ribe, near the present frontier of Denmark, is fringed by a nearly continuous band of marsh-land, much of which is below the level of the sea, and is protected from inundations by dykes, as in Holland. Between these two fertile regions lies the central barren tract of sandy and peaty land, which stretches, with a gradually increasing breadth, from the extreme south of Holstein, through Schleswig, to the centre of Jutland, near Horsens, from which place it rapidly narrows towards the north, and is finally lost sight of in the neighbourhood of Thisted. North and east of the boundary of this sandy tract the character of the country changes, and cretaceous deposits, striking north-west and south-east, with fringes of boulder-gravel, replace those that have just been mentioned, both in North Sealand and the northern part of Jutland. These cretaceous deposits present the same features in Denmark as elsewhere, namely, rounded hills of slight elevation, often capped by a bed of gravel or other detrital material. Nowhere do the hills reach any considerable elevation, the highest in the country, appropriately termed the Himmelbjerg, or Heaven's Mount, not exceeding 500 feet in height.

Each of the great geological formations of Denmark is characterised by a distinctive system of agriculture, although possibly the lines of division are, in fact, not quite so sharp as might be inferred by reading this brief description and classification. Still, it may be said generally that the region of the boulder-clay and boulder-gravel is the great dairy district both in Denmark and the Duchies; the marsh-land region and the recently formed land of North Jutland are the great cattle-feeding districts, although in some of the marshes a large extent of land is under arable cultivation; while in the cretaceous district of the north of Jutland, young store oxen are reared for the purpose of being finished off in summer on the grass-land of the marshes. As to the central sandy tract, most of it is still waste or woodland, generally the former; but here and there attempts to bring the land under cultivation are indicated by the yellow flowers of the lupin, which is grown in those cases for the purpose of being ploughed in as green manure.

The fences contribute not a little to the varied aspect which the country presents in different districts. In the marshes they are simply dykes and ditches, but in the east of Holstein and Schleswig high banks, capped with luxuriant hedges, remind one very forcibly of some parts of the West of England. In the Danish islands the fields of large farms are not unfrequently divided by warren sod-walls, and the same kind of fence is used in some districts as the boundary between peasant-farms, the fields of which are marked out by lines of boulders which have been dug out of the land.

The climate of Denmark is insular, that is to say, it is not characterised by such extremes of heat and cold as distinguish the summers and winters of inland countries. Mr. Rainals, Professor Wilson, and M. Tisserand write in the same laudatory strain of the beauty of the Danish climate. The mean winter temperature (December to March inclusive) is a little below 32° Fahr., and the rainfall of the four months averages 6½ inches, spread over 53 days, out of which snow falls on 22. During the spring months of April and May the mean temperature is 47½° Fahr., and the rainfall a little under 3 inches, spread over 22 days; in the summer the average temperature is 62° Fahr., the rainfall nearly 7 inches, and there are 40 rainy days; and in the autumn the average temperature sinks again to a mean of 46½° Fahr., while the rainfall reaches a maximum of over 7 inches, spread over 42 days. Further details, with charts showing the relative prevalence of the winds from the different points of the compass, are given in Professor Wilson's Report; but the main facts just stated show that although the winter is long it is not so severe as the northern situation of the country would lead one to expect; the spring and autumn are mild, and the summer-heat is not excessive. Under these conditions wheat is not generally sown until October. Field-work is not necessarily entirely suspended during the winter, except in the northern parts of Jutland, where very little ploughing can be done until the end of March, or, in some seasons, the beginning of April. In the more southern districts the advent of spring is a week or two earlier. Young stock are generally turned out, at least by day, about the beginning of May, and the cows shortly afterwards are tethered on the artificial grasses, where they remain until October, but are turned out by day until the middle or end of that month.

Such being the conditions under which farming is carried on in Denmark, it remains to describe the systems of agriculture which are considered the most suitable to the country and the most profitable to the cultivators of the soil.

AGRICULTURE OF DENMARK.

It has been already indicated that two principal systems of agriculture are practised in the area which now comprises the Danish kingdom, the most important being the Dairy Husbandry, and the other the Meat Husbandry, if such a title may be considered admissible. Under both systems a considerable quantity of corn is grown, and both are characterised by the early slaughter of surplus calves. An important difference under the latter head is that on meat-making farms only the bull-calves are kept, nearly all the heifer-calves being killed soon after birth; while on dairy-farms the only survivors of this agricultural "massacre of the innocents" are the small percentage of heifer-calves deemed necessary to keep up the herd. In addition to these systems of arable-land farming, the marshes of Denmark, and more particularly of Schleswig-Holstein, furnish illustrations of the method adopted to prepare bullocks for the English market, including their finishing off on grass-land. With this brief introduction I proceed to describe in general terms the usual methods of cropping the land, and the manner in which the prevailing systems of farming are carried out; and at the same time to draw attention to such improvements upon the usual customs as arrested my attention during my journey in 1874.

Farm-Buildings.—The cost of farm-buildings in Denmark is very great for the acreage of the farms, and may be put down at 7*l.* per acre, or even more, in some instances. Mr. Rainals' Report is illustrated by plans and elevations of the two descriptions of farmhouse usually seen in Denmark and the Duchies. The first, designated as A, p. 276,* is to be seen all over the country, with the exception of the marshes, and a part of the Geest region of Holstein, to which districts the second kind, B, pp. 277 and 278, is confined, being, in fact, an importation from Holland. The former, or general plan, is a hollow square, as is not unusual on the Continent, one side being the dwelling-house, a second the barn, faced by the stables and cow-shed which form the third side, while the fourth, in which the gateway is situated, opposite to the house, is made up of sheep-house, implement-shed, workshop, &c. &c. The farm-buildings of large proprietors are arranged on the same principle, but the four sides of the square are generally detached, thus lessening the probable loss in case of fire. On these farms the barn is a huge structure (stacks being almost as unknown now as they were in 1860); and not unfrequently it forcibly illustrates certain phases of the unprofitable use of materials, the roofs especially being clumsily constructed, and strutted from the floor in a manner which interferes considerably with the storage-room. On the other hand, some of these barns, like Mr. Tesdorpf's (Fig. 1, p. 324), are skilfully constructed. That gentleman has also adopted the Norfolk system of box-feeding with the best results, and the annexed cut (Fig. 2, p. 324) shows the arrangement of the boxes, and the manner in which the feeding-trough is raised as the manure accumulates.

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* 'Journal of the Royal Agricultural Society,' vol. xxi., 1860.

Above the cow-sheds and stables is generally a hay- and straw-loft, and the question of ventilation is therefore of importance. I saw on several Danish farms the method of ventilating by means of divided shafts, which Mr. Mechi has so long adopted and advocated in England. The only difference is that the Danes divide their shaft into four parts instead of two, but that is not a matter of cardinal importance. The essential point is that with these divided shafts there is always an upcast and a downcast—an inlet for the fresh air as well as an outlet for the vitiated atmosphere. The following sketches (Figs. 3 and 4, p. 325) will make clear the mode of constructing these shafts, which is adopted in Denmark.

Cultivation of the Land.—The course of cropping which prevails in Denmark is very similar to that *Koppelwirthschaft*, which I described last year as characteristic of Sweden and Norway, namely, bare fallow, three-years' corn, and three-years' grass. But there is a remarkable difference between the national practices of the Scandinavian and the Cimbrian peninsulas. In the former, the bare fallow succeeds a crop of oats, and is followed by winter-corn, then by grass for two or three years or more, and afterwards by barley and oats for two, or perhaps three years, returning again to fallow. In Denmark the bare fallow succeeds the grass, and is followed by winter-corn, then by spring-corn for two or three years, the last corn-crop being sown out with a mixture of seeds. The differences in the geographical position, climate, and other conditions of the north of Denmark and the south of Sweden are so slight that it is remarkable to find this prevailing divergence of practice in the

Fig 1—*Section of the Barn on Mr Tesdorpf's Farm at Ourupgaard, Falster.*

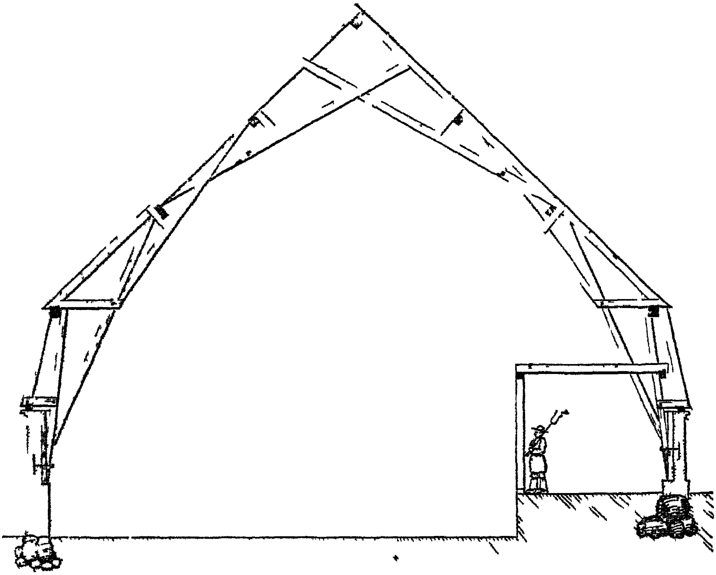


Fig. 2—*Section of Byre on Mr. Tesdorpf's Farm at Ourupgaard, Falster, showing the arrangement of feeding boxes.*

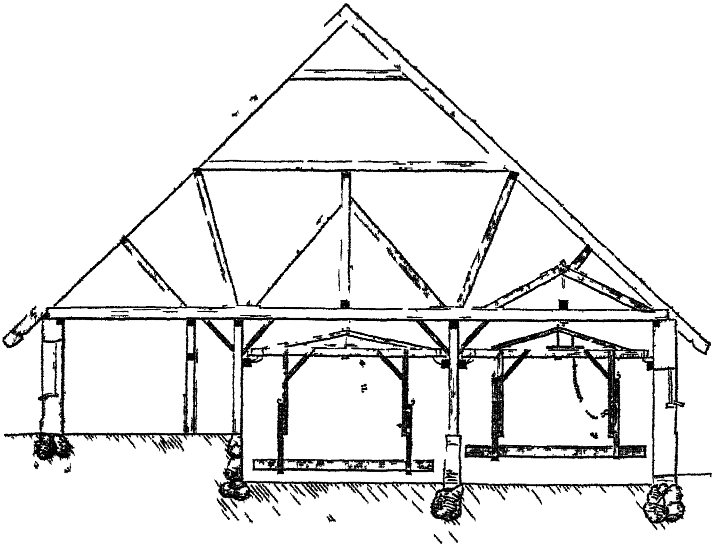
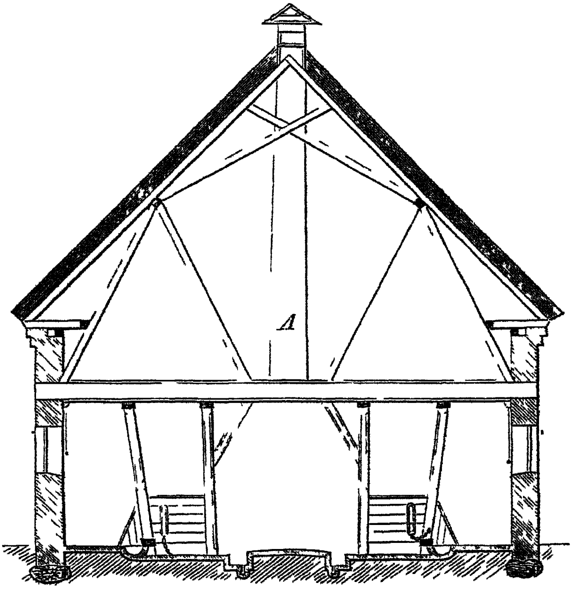
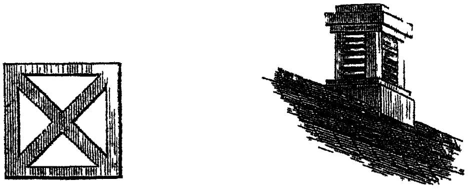


Fig. 3.—*Section of a Cow-house on Mr. Heide's Farm at Kjærsgaard, Jutland, illustrating the mode of Ventilation by means of a Shaft through the Hay-loft above.*



A Ventilating Shaft.

Fig. 4.—*Section and external view of a Ventilating Shaft on Mr Warburg's Farm near Aalborg, Jutland.*



Cross Section

External View

two countries. Its existence suggested an examination into the consequences which relatively follow, and I have no hesitation in giving my vote in favour of the Swedish rotation. In Denmark it is impossible to avoid being struck with the foulness of the spring-corn, especially the oats, which, as just stated, are usually taken after barley, which has been preceded by wheat, and is sometimes repeated a second, or even a third year. This foul land, instead of being fallowed on the Swedish plan, is sown out with clover and grasses, the result being that the young plant receives a plentiful sowing of weed-seeds before the oats are harvested, and therefore is never clean. When the seeds are broken up, the bare fallow is not half enough worked to destroy the numerous crops of weeds which again and again spring from the immense stores of seed which the land contains. The fallow is, no doubt, cleaned to some extent; and the first crop taken after it—wheat or rye—is generally in a more or less creditable state in comparison with the next crop—barley, which always shows a large admixture of rubbish; while the following crops of oats are progressively more and more foul. In fact, it must be conceded that the greatest fault of Danish farming is the generally dirty condition of the land. Professor Wilson came to a similar conclusion in 1866; and in his Report (p. 73), already quoted, observes: "There is but little doubt that the dirty state of a very large proportion of the land under tillage cultivation is due to the system of cropping usually followed, which is entirely opposed to the principles upon which a sound rotation should be based." M. Tisserand, also, has not allowed this defect of the Danish system to escape his criticism, otherwise generally favourable. He states roundly that the later stages of the course of cropping usually pursued, especially the oats, are sometimes completely smothered, having the appearance of fields of thistles and poppies, while the artificial grasses, which form the end of the course, also show their presence; but the conclusion that he draws is, that bare fallow is a necessity, and that one unproductive year is by no means too large a proportion under the circumstances, although he recognises the importance of a more extensive cultivation of root-crops.

There are, however, variations of the national system to be found on many well-managed farms, and it will be as well to preface any further remarks by a few examples.

Mr. Vallentiner, Gjeddesdals, Sealand.		Mr. O. v. Schestedt Juul, Ravnholdt, Fyen (double rotation)	Mr. Westenholz, Matrup, near Horsens, Jutland (double rotation)
1. Bare fallow or beans.	1. Bare fallow.	1. Bare fallow.	1. Bare fallow.
2. Wheat.	2. Wheat.	2. Wheat.	2. Rye.
3. Barley.	3. Barley or roots.	3. Barley.	3. Barley.
4. Vetches.	4. Oats.	4. Seeds mown.	4. ¼ roots, ¾ mixture.*
5. Oats.	5. Seeds mown.	5. Seeds grazed and half fallowed.	5. Oats.
6. Seeds grazed.	6. Seeds grazed.	6. Roots.	6. Seeds generally grazed
7. Do.	7. Oats.	7. Mixture (oats, barley, and spring-wheat).	7. Seeds
		8. Seeds.	8. Barley.
		9. Seeds.	9. Rye.
		10. Oats.	10. Seeds grazed
			11. Seeds cut.
			12. Oats.

* Oats, rye, beans, and vetches.

Mr. Trohldahl, Graa Mólle, near Aarhuus, Jutland.	Kammerherre Berner-Schilden, Clausholm, near Randers, Jutland.	Lieut. Mansa, Sö, near Nykjobing, North Jutland.
1. ½ Bare fallow, ½ roots.	1. Bare fallow.	1. Bare fallow.
2. Wheat.	2. Wheat.	2. Rye.
3. Barley.	3. Barley.	3. ⅓ barley, ⅓ vetches, ⅓ buckwheat.
4. Oats, manured.	4. Peas and oats cut for horses.	4. White oats.
5. Barley.	5. Tares and oats cut green.	5. Black oats.
6. Oats, manured.	6. Rye.	6. Seeds mown.
7. Seeds (½ mown).	7. Seeds.	7. Seeds grazed.
8. Seeds grazed.	8. Seeds.	8. Seeds
	9. Seeds.	9. Seeds
	10. Oats.	

Thus, however much the rotation may be varied in special instances, the principle remains the same, except in a few cases where the Swedish plan has been adopted.

As a rule, the bare fallow is dunged for the winter-corn; and on ordinary peasant-farms no other course in the rotation obtains any manure. But on better-managed farms it is usual to give a dressing of farmyard-manure to the oat-crop, and to that part of the barley-course which is devoted to roots. The small number of large proprietors who are the pioneers of agricultural progress in Denmark also use large quantities of superphosphate of lime, especially for roots. Dissolved guano is now finding its way from Hamburg to Denmark, but the use of purely ammoniacal manures is comparatively little understood.

It will have been observed that one year in bare fallow is at the basis of every variation of the national rotation, although in the cases which I have termed "double rotation" its importance is lessened by the repetition of the course, minus the unproductive year. Mr. Vallentiner takes beans on a portion of his fallow course, and Mr. Trohldahl utilises one-half of his by growing a root-crop upon it; but generally the few roots that are grown displace a certain acreage of barley, as also do tares or peas, which are cut green for fodder.

Professor Wilson draws attention in his Report to the large proportionate area of cultivated land (about one-sixth) which is annually left in bare fallow, and to the insignificant proportion of tillage area (not one-quarter per cent.) which is annually under root-crop. He expatiates on the reduction in the total production of the land of the country (equal to about 16 per cent.), which is one result of this system, and on the consequently enhanced cost of production of the crops actually grown. It is impossible for any one acquainted with the results obtained in England, and especially in the east of Scotland (where the climate approaches more nearly to that of Denmark), by the growth of fallowing crops, to doubt the soundness of this criticism, unless, as Professor Wilson puts it, "some special reasons can be adduced in support of a practice which it is clearly contrary to the interest of the individual, as well as of the general community, should continue." Both he and I were often told that the bare fallow was necessary to clean the land; but the growth of root-crops would be a much more effectual means of obtaining that result; and in some cases, as at Mr. Trohldahl's, I have seen better crops of wheat (in this particular case Hallett's Pedigree) after roots than after bare fallow, although the instances were rare in which such a comparison of the two systems could be made.

The true reasons for the small acreage of turnips grown in the Danish islands and in South Jutland are (1) the scarcity of labour, and the ignorance of both farmers and labourers on the subject; and (2) root-crops are not esteemed as a food for dairy cows, whose milk is used for the manufacture of the finest butter. With regard to the first point, I may mention that Mr. Westenholz, who farms nearly 600 acres near Horsens, assured me that, owing to want of labour, he had not hitherto been able to grow more than 5 acres of turnips per annum. But for this he would prefer to grow roots on the whole of his fallow-course, as he was convinced that the exposure of his land to the sun during the whole summer did a great deal of harm to it; but men were very scarce, and neither women nor children could be got to work in the fields. Mr. Heide, whose property is in the same district, and who farms rather more than 300 acres, grows turnips on his light land; but he had great trouble in teaching his labourers how to ridge and clean them; and were he not so great an enthusiast in agricultural progress, it is probable that he would not have succeeded. By means of his roots he is enabled to fatten 20 Jutland oxen every year, in addition to his cast-cows.

This leads to the second point, namely, the disinclination to use roots as a food for dairy cows. When farmers get very high prices for butter, provided only that the butter is of the finest quality, in a country where every other kind of farm-produce is relatively cheap, it is natural that they should be jealous not to give their cows any food that is known to be injurious to the quality of their staple product; and it is well known that a slight difference in the flavour of a dairy product has a large influence upon its price. Therefore in the dairy districts everything is sacrificed to the production of the largest quantity of the best quality butter. For this reason calves are systematically killed as soon as they are dropped, because the mother's milk is so valuable that rearing calves is not considered a profitable operation. Thus bare fallow is preferred to a turnip-crop, because turnips taint the butter, and there are no steers to feed.

Professor Wilson made some interesting calculations upon the quantity of meat that could be produced per acre by farming on the Danish plan, and on our four-, five-, and six-course rotations, on the ground that—

> "We are accustomed to base our calculations of the meat-producing capabilities of our farms upon the quantity of green crops they can produce; and what is true in regard to meat is equally so in regard to milk; experiments and experience have shown us that they bear a certain known ratio to each other. If this rule were applied without any modifications to the Danish rotations, the result would be very small and unsatisfactory indeed; we may, however, take the straw produce of their grain crops into our calculation, as having the same food-value as the green crops, since chemistry has shown us that it is far more profitable to use the straw as fodder than merely for litter purposes."

Professor Wilson then calculates that, allowing 30 cwt. of straw per acre for the grain-crops, 10 tons per acre for seeds, and 20 tons per acre for roots, we should find that the four Danish rotations selected by him would give as follows:—

	Green-Food per Acre, per Annum.		Meat per Acre per Annum.
	cwts.		lbs.
Rotation No. 1	106	equal to	78
" 2	120	"	90
" 3	85	"	63½
" 4	88	"	66

Against this he contrasts our four-course system for light land (roots, barley, clover, wheat); five-course for heavy land (roots, barley, two-years' clover, wheat); and six-course for the heaviest land (roots, barley, clover, wheat, beans, wheat); and he makes the following calculation of the produce in green-crops and meat:—

	Green-Food per Acre per Annum.		Meat per Acre per Annum.
	cwt.		lbs.
Four years' rotation	160	equal to	120
Five years' rotation	170	"	125
Six years' rotation	120	"	90

Professor Wilson's Report was written in 1866, and his argument is apparently based upon the assumption that the Danish farmer ought to endeavour to make as much meat per acre as his circumstances will permit; or that if he prefers to utilise his green-crops and straw in the production of milk, then the same reasoning will hold good, because "what is true in regard to meat, is equally so in regard to milk; experiments and experience have shown us that they bear a certain known ratio to each other."

Unfortunately, however, for this argument, it gives no weight to the variation in the quality of the produce of the milk—*i. e.* butter—which is due in great measure to the nature of the food given to the cows; and when we consider that the price which a Danish farmer can obtain for his butter varies from 9*d.* to 1*s.* 6*d.* per Danish lb., on the farm, according to its quality, it is not difficult to understand that he prefers to produce a somewhat restricted quantity if it will realise a much higher price. At the same time, there can be no doubt that an extended growth of roots would enable the Danish farmer to produce a considerable quantity of meat, in addition to his present production of butter, to which end he now devotes not only his green-crops and straw, but also, on an average, two-thirds of his home-grown corn.

It will be interesting here to quote M. Tisserand's opinion in reference to Danish agricultural practice, if only to show how the same modes of procedure, viewed at nearly the same time (M. Tisserand's Report was based on a journey made in 1863, and was published in 1865), may suggest different conclusions to experienced men who regard them from opposite stand-points. It is again the old story of the colour of the shield. M. Tisserand observes:—

> "With the semi-pastoral rotation of from eight to eleven years the farmers can keep nearly one head of cattle per hectare (2½ acres), that is to say, a proportion nearly double that which is possible under the triennial rotation. But it must be remembered that to render the former rotation possible, the country must already be in a certain state of prosperity. In fact, it requires much more capital, say from 8*l.* to 10*l.* per acre, and its conditions resemble those of the most intensive forage-culture (*Anglicè*, meat-making) to which in fact it must tend.
>
> "With the Norfolk rotation, an arable farm of the same extent in England will employ a working capital of from 11*l.* to 14*l.* per acre; while in the North of Great Britain, where the semi-pastoral agriculture predominates, the capital engaged is a little less than that of Denmark, being only about 6*l.* 10*s.* per acre. But if in the four-years' shift of Norfolk the cost of labour amounts to 30*s.* per acre, in the Danish rotation it does not attain 18*s.*, and in the semi-pastoral rotation of Scotland it is reduced to 13*s.* or 14*s.* per acre.
>
> "The semi-pastoral agriculture of England cannot therefore be declared better than the semi-pastoral agriculture of Denmark. When the Danish cultivators augment their farming capital (*fonds de roulement*) by the utilisation of human manure, or the importation of commercial fertilisers, such as guano, bones, oilcakes, &c., by the introduction of a certain extent of cleansing crops in the fallow, it is beyond doubt that they will be able, thanks to the admirable condition of the soil and the climate in which they are placed, some day to do better and more than Great Britain, and to extract a higher profit from their land."

Without venturing to assume the position of arbitrator between M. Tisserand and Professor Wilson, I may be allowed to express my opinion that the true test of excellence of different systems of agriculture is to be found in the amount of profit per acre which they relatively yield to the occupier of the land, under circumstances otherwise similar. Therefore it seems to me that the tests of capital employed, and expenditure on labour, which M. Tisserand makes use of, are open to quite as strong objections as that which I have already mentioned against Professor Wilson's test of the theoretical production of meat, not the least being the difficulty of comparing the farmer's capital in a country where the inventory belongs to the owner, with that in a country where it belongs to the occupier.

The following description of one of the best-managed farms in Denmark furnishes a practical illustration of most of the points hitherto mentioned. More particularly it exemplifies the three chief rotations of cropping to which I have drawn attention; namely, the ordinary shift on moderately light land; the "double shift," as I have termed it, on heavy land; and the cultivation of very light land, with one course devoted to green-crop to be ploughed in as manure. Mr. Heide, the owner and occupier of Kjærsgaard, the farm about to be described, has entirely abolished bare fallow, after a most persevering, and ultimately successful, effort to educate his labourers in ridging and cleaning his root-crops; and he is much more advanced than his neighbours in the use of improved machinery and artificial food and manures. His results must not, therefore, be taken as those of an average Danish farmer, for in all probability many of his neighbours do not obtain from their land much more than one-half the produce per acre that he does. Still, what Mr. Heide has already done, others may do hereafter; and it may therefore be useful to urge that, though Kjærsgaard is a very awkward farm to work, bare fallow forms no part of either of the three rotations pursued upon it.

Other points will also strike the reader of the following description, which I have abbreviated from the article by Mr. Hertel, in a Danish agricultural journal ('Ugeskrift for Landmænd'). For instance, the artificial manure employed by Mr. Heide is in nearly every case of a phosphatic nature, although about one-half the land is annually in white-crop. This is another illustration of the disinclination of Continental farmers to use ammoniacal manures—a circumstance to which I have referred in former Reports. The excellent system of book-keeping adopted and thoroughly carried out by Mr. Heide, in common with most of the better class of Danish farmers, has enabled me to give his calculations as to the cost of a cow at three years old, when about to calve for the first time; also the cost of keep of a milch-cow for a year; and the relative profit derived from meat-making and dairying. At three years old he finds that a cow has cost 11*l.* 17*s.* for food, and the calf at birth being worth 13*s.* 6*d.*, her total cost-price is about 12*l.* 10*s.* This is much less than the results of Mr. Swartz's calculation, which amounted to nearly 20*l.*, quoted in my Report on Sweden and Norway;* but Mr. Heide has a much less rigorous climate to contend with, and therefore can keep his animals for a longer period on grass—a provender that is also less costly in a country where the winters are neither so long nor so severe as in Sweden. The value of the keep of a milch cow is put down at 10*l.* 13*s.* 6*d.*, in addition to the cost of labour, attendance, dairying expenses, and rent of stall, but Mr. Heide's books show a profit of 25*s.* per cow after making a fair allowance for all these items. The feeding-beasts, on the other hand, show a small balance on the wrong side of the ledger, without making any charge for labour and other etceteras; but when one learns by the accounts that they were sold at about half-a-crown per stone of 8 lbs. living weight, no surprise can be felt at their being unprofitable. They leave their manure behind them, it is true; but when the Danish farmer has so bad a market for meat, and so good a one for butter, there can be no question that he is a wise man of business in devoting his energies to the dairy. Mr. Heide neutralises to some extent the apparent loss upon his feeding-beasts by using them at first as working-oxen, instead of horses; but it is evident that the cattle he has bought (Jutland and Swedish bullocks) for fattening are not good feeders, and that he has no market good enough to make stall-feeding a profitable speculation.

The following is the description of his farm:—

Kjærsgaard, near Horsens, Jutland, owned and occupied by Mr. Heide.

This farm has a total area of 321 acres, viz., 254 acres of arable land, 56 acres of meadow and marshland, the remainder being garden, paddock, yards, houses, and plantations. The total hard-corn upon which the land is taxed is 13 tönder, 3 skjepper, 3 fjirdingkar, and 2 album.† The taxes and dues in 1872 were rather more than 4*s.* per acre, as follows:—

	£	*s.*	*d.*
Crown taxes	15	3	0
Bank dues	2	2	3
County taxes	11	11	0
Insurance	4	16	10
Parish taxes (8 rd. per td. hard-corn) ..	12	4	6
Tithes	19	18	5
Total	£65	16	0

The fields of Kjærsgaard are rather hilly, but for the most part slope southwards. The land is light and tender, and the surface-soil on the cultivated land is generally from 1 to 2 feet deep. The subsoil is very irregular, in some places consisting of sand, and elsewhere of sand and clay, or poor clay. Of the cultivated land, only 20 acres have been pipe-drained, the remainder not requiring it, as the subsoil is of a sufficiently porous nature to drain the land naturally.

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* 'Journ. Royal Agric. Soc.,' Second Series, vol. xi., Part I., 1875, p. 217.

† 1 td.=8 skpr. of 4 fjrdkr. of 3 alb.

The nature of the soil being rather irregular, and the fields, which have been bought from time to time, being differently situated, the farm has been divided into three parts, each of which is cropped upon a different shift.

A. *The Upper Farm* (Overmarken) contains the best soil, and is situated nearest to the buildings. All the fields have been marled. The older portion of the farm was marled in 1859–61 with 125 cartloads per acre, and the land bought later on was marled, either by the previous proprietor, or during the first or second year after its purchase by Mr. Heide. The usual system of bare fallow was pursued for three years, but was entirely discontinued in 1862. The greatest inconvenience experienced by giving up the fallow course was the difficulty of getting rid of the many large and small stones which existed near the surface under the thin furrow; and until the subsoil-plough was made use of and the stones got away, deep ploughing could not be done. The land was infested with weeds, and it was exceedingly difficult to get it clean, especially until it could be ploughed deeply and manured sufficiently; however, the weeds were extirpated by degrees, and the land is now as clean as any well-managed farm where bare fallow still holds its place in the rotation. This Upper Farm consists of 140 acres, and is divided into sixteen fields, each of about 8 or 9 acres. Until 1871, the Upper Farm was worked in 14 shifts; but as some land, recently bought, has been added to it, it has since been worked in sixteen fields. The nature of this alteration will be seen from the following comparative statement of the rotation pursued before and after the recent addition:—

MODE of WORKING the UPPER FARM in each of the 3 YEARS, 1870–71 to 1872–73.

1870–71.	1871–72.	1872–73.
1. Oats (green).	1. Oats (green).	1. Oats (green).
2. Turnips.	2. Turnips.	2. Turnips.
3. Barley.	3. Barley.	3. Barley.
4. Mixed corn.	4. Mixed corn.	4. Mixed corn.
5. Winter-corn.	5. Winter-corn.	5. Winter-corn.
6—8. Clover and grass.	6—8. Clover and grass.	6, 7. Clover and grass.
9. Barley (green).	9. Barley (green).	8. Barley (green).
	10. ½ Turnips and ½ mixed corn.	9. Turnips. 10. Barley.
10. Mixed corn. 11. Winter-corn.	11. ½ Barley and ½ Winter-corn.	11. Mixed corn. 12. Winter-corn.
12. Oats.	12. Oats.	13. Oats.
13, 14. Clover.	13, 14. Clover.	14—16. Clover and grass.

The yield of the harvest of the Upper Farm in 1872 was:—

	Imperial Acres.	Thraves (60 Sheaves).	Bushels per acre.	Fold.
Rye	18	152	33¼	12
Barley	26	226	42	15
Oats	18	163	62½	22½
Mixed corn	16	162	49¾	18

The details of the cultivation and manuring of the land on the Lower Farm, consisting of moderately light land, which are given below, render it unnecessary to occupy space by giving similar details in reference to the more extended rotation pursued on this Upper Farm.

B. *The Lower Farm* (Nedermarken).—This part of the farm is flat, and consists of light soil, which was previously overgrown with heath; broom also grew very strongly, though this plant, as a rule, is a sign of good quality of the land. The Lower Farm comprises 73 acres, and is arranged into eight fields, each of about 9 acres in extent, with the following course of cropping:—(1) Half-fallow; (2) Spring rye (St. John's rye); (3) Turnips; (4) Barley; (5) Rye; (6) Oats; (7, 8) Clover and grass.

The fallow-field is manured with about 11 loads of farmyard-manure per acre; and from 9 to 10 pecks of St. John's rye, without any admixture of spring-corn, is sown during the latter part of June. It is fed-off three times during the autumn, this generally being the time when grass is scarce. The next autumn, after the rye has been harvested, the stubble is ploughed very deeply, and generally twice—the first time with a double plough. Towards spring, from 8 to 9 loads of farmyard-manure per acre is carried on the field and left in a heap, mixed and covered with compost. In the spring the field is harrowed with a Swedish or light harrow, and is then rolled; in May it is ridged up, the farmyard-manure is spread in the furrows, and upon it is sown ¾ cwt. superphosphate, ¾ cwt. dissolved Peruvian guano, and 42 lbs. of bone-meal, per acre; the manure is covered by splitting the ridges, and the turnips are sown with a light English drill, which is attached to and follows behind the Tesdorpf two-sectioned roller. The Tankard red-top turnip is generally sown, as it grows well on light soil, and can be kept until April. It is not, as a rule, sown later than the middle of May, as in that way time is left for a second sowing in case the first braird is destroyed by the fly (which however, for many years has done no material damage), or in case the young plant should be broken by storms, which is not unfrequently the case. The worst enemy of the turnips is, however, the white butterfly caterpillars, which appear in large numbers in August and consume the turnip-tops. A great many birds make their appearance in the autumn, but they come too late to save the plant.

When the turnips are harvested, the leaves are spread out and ploughed-in deeply; in the spring ¾ cwt. superphosphate and ¾ cwt. bone-meal are put on the land and harrowed in with a Swedish harrow; after that a second harrowing is given, and the land is then rolled. Chevalier barley is now sown, and the seed is covered by the double-plough, and after that the earth is rolled with the *stangtromlen* (a kind of roller), which is a capital implement for preventing the dry earth from being raised by the wind.

Immediately after the barley has been harvested the stubble is ploughed to double the usual depth, and after that 1⅛ cwt. superphosphate, ¾ cwt. dissolved Peruvian guano, and ¾ cwt. bone-meal, are sown per acre, and harrowed down with the Swedish harrow. The land is then harrowed over with a light harrow, Provsti rye is sown, and the seed is covered by means of a zig-zag harrow.

In the autumn following, the rye-stubble is ploughed under; and in the course of the winter, or early in the spring, about 11 to 12 loads of stable-manure per acre are conveyed to the field and ploughed-in immediately; after that, oats, with clover- and grass-seed, are sown. The two following years the field remains in clover and grass.

In 1872, the yield of the harvest of the Nedermarken, or Lower Farm, was as follows:—

	Imperial Acres.	Thraves.	Bushels per Acre.	Fold.
Rye (St. John's)	9	62½	26	9⅜
Rye (Provsti)	9	48	20	7¼
Barley	9	52½	27	9⅞
Oats	9	39	29½	10½

C. *The Meadow Farm* (Engmarken).—Besides *Overmarken* and *Nedermarken*, there belong to Kjærsgaard about 40 acres of light and poor soil, situated at a distance. It previously belonged in part to a piece of meadow, and that portion was bought in 1871, because Mr. Heide thereby came in possession of a turf-meadow of about 14 acres in extent, and got the control over a small brook. These fields surround a meadow of 28 acres, which they protect.

On this area one ram and twenty ewes were kept, with their lambs, and from 12 to 13 acres were used for rye, barley, and potatoes. It has since been decided to discontinue keeping the sheep, and to cultivate the land carefully, manure it with compost and artificial manure, and to introduce the following rotation:—(1) Lupins, to be ploughed in; (2) Rye; (3) Turnips and potatoes; (4) Rye.

The following is the mixture of seeds used for the clover and grass land per acre:—

2¾	Danish lbs.	Silesian red clover.[*]	2¼	Danish lbs.	Italian rye-grass.
2¼	„	Late ditto.	2	„	Timothy grass.
3	„	Alsike.	¾	„	Dog-grass.
2¼	„	White clover.	¾	„	Meadow-fescue.
2	„	English ryegrass.	1½ to 3 oz.		Carraway seed.

There is thus sown 18 D. lbs. (equal nearly 20 lbs. English) of seed per acre, viz. 10 lbs. of clover- and 8 lbs. of grass-seeds. As previously mentioned, there are in the Upper Farm (Overmarken) five fields of between 8 and 9 acres each, and in the Lower Farm (Nedermarken) two fields of about 9 acres each, annually in clover and grass. These are intended to summer forty milch cows, three to four bulls, five to six heifers, and eight horses. It is, therefore, not calculated that any portion of the grass-breaks should necessarily be saved for hay; but, with the exception of very dry years, sound clover-hay has annually been made, generally from 30 to 40 loads; and the last two years (1872–3) the quantity amounted to between 75 and 85 loads of 15 cwt. The clover is mown during the latter part of May or the beginning of June, before flowering takes place, thereby gaining superior hay and an early aftermath. The cows are, as a rule, not put upon the meadows; but in 1868 and 1870 they were pastured there for a short time, whereas the young cattle (which are generally in the stalls until the hay is cut) and some of the purchased bullocks are put in the meadows after the hay-harvest. The yearling calves are not fed on grass the first year, and the cows, when upon grass, are always tethered, being watered twice a day from a water-cart.

Horses.—Eight working horses are kept, and they work hard all the year, except during June and July, when they are generally turned out to grass. The autumn, as a rule, is the busiest and most important time of the year on Danish farms, and this is especially the case where, as at Kjærsgaard, the bare fallow course has been discontinued, and the cultivation of root-crops is of importance. Mr. Heide is, therefore, in the habit of buying some working oxen every summer in order that two or three pair may be used in the autumn for carting turnips and manure, as well as for ploughing the land, &c. Afterwards they are fattened in the winter. If bullocks are not thus procured and made use of, a pair of horses for about 60 acres is considered necessary.

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[*] The Danish lb. is one-tenth more than the lb. avoirdupois.

While the horses are fed in the stable they receive a daily allowance of 1½ peck of crushed oats, ¼ to ½ bushel of carrots, and 9 lbs. of hay, which is given in the racks placed under the manger. This arrangement is better than having the rack placed above the manger, as in that case the hay-seeds and dust fall into the horses' ears and into the fodder. It is also more natural for a horse to feed with his head downwards than reaching upwards. Last year the horses consumed 1053 bushels of oats, 552 bushels of carrots, and 10 large loads of about 16 cwt. of hay. Of late years horses have not been bred, but have been renewed by purchase.

Cattle.—The stock of cattle consists of about forty Angeln cows, two or three bulls, and from twenty to twenty-five calves and young cattle. The number of cows has not been increased of late years, although the area of the farm has been enlarged. It is, however, contemplated to increase the number of calves and young cattle to from twenty-five to thirty, and otherwise to increase the number of cattle, by purchase, for fattening. Milking-cows are only renewed by breeding on the farm. In 1872–73 the number of young cattle was increased by two bulls and three yearling heifers.

In 1859 Mr. Heide bought twelve heifers of the best strain he could get, and one bull; in 1860, again, six heifers were purchased; and during the following four years, ten, partly heifers and partly cows. The first bull was a disappointment, as he became coarse, and developed more the qualities of a feeding- than a milking-animal. The cows got by him have, however, been all drafted for some years, although seven of the heifers first bought are still in the herd. These animals are now 15, 16, or 17 years old. In 1862 Mr. Heide received of Mr. Suhr, of Rosenlund, as a present, a bull-calf, and by this bull the whole of the existing herd has been got, with the exception of the old cows just mentioned. All the cattle are very strong, well built, and have the characteristic marks of good milkers well developed. It may be mentioned as a curiosity that Mr. Suhr claims, as characteristic of the Rosenlund cattle, that they have folds of the skin lying across the ribs somewhat like the mark left by striking the animal. Many of the Kjærsgaard cattle exhibit this feature, which seems to indicate that it is inheritable.

No fresh blood has been introduced into the herd for between ten and eleven years, and there has been no appearance of any detrimental consequences; on the contrary, a superior stock of cattle, having a uniform character, has been produced. Calves from this farm are consequently much sought after, and fetch 13*s*. 6*d*. each when born, and an additional 6*d*. or 7*d*. per day of their age at the time of sale. Thus the price of a calf, three months old, would be about 3*l*.

A very interesting account of the cow-keeping and the production of milk was published in the 'Tidsskrift f. Veterinærer' (the Veterinary Gazette) for 1873, page 50. One cow, which gave on an average about 650 gallons of milk per annum, did not leave off giving milk a single day for four years and a-half. During the seven years this cow was on the farm she gave milk on an average 348 days a year: while two others gave milk respectively on 329 and 274 days a year, namely, 693 and 768 gallons. During the eleven years from 1861–72, every cow on the farm has run dry on an average for 39½ days a year, and, according to the weekly trial-milkings, has given 603 gallons of milk per annum. The largest produce during these years was in 1867–68, when the average produce of thirty-six cows was 648 gallons of milk, three of the cows giving above 880 gallons, six from 770 to 880 gallons, seven from 660 to 770 gallons, ten from 550 to 660 gallons, five from 440 to 550 gallons, and only five below 440 gallons of milk. In 1872–73, however, the produce was even larger, namely, 661 gallons per cow.

Not unfrequently, the cows continue to give milk without intermission, and the milk-fever is therefore a dreaded enemy, which formerly carried off two or three of the best cows every year. In order to avoid this loss, the cows are fed very scantily when milking is discontinued, sometimes only with straw and hay, and yet it is very often necessary to milk them before calving. Sometimes the heifers are also put on the same fare; but it is not always that it has the desired effect.

The calves are reared as follows:—During the first four to five days the calf gets nothing but about 5 quarts per day of its mother's milk as it comes from the cow. During the second week it gets the same quantity of new milk as it comes from the cow, and nearly half a gallon of skimmed milk. The third week its daily allowance is rather more than a gallon of new milk and the same quantity of skimmed milk; fourth week, two-thirds of a gallon of new milk and 2 gallons of skimmed milk; fifth week, 3 gallons of skimmed milk; sixth week, 3½ gallons of skimmed milk; seventh week, 2½ gallons of skimmed milk and water, ½ D. lb. of meal, hay, and a little oilcake in the rack; eighth week, 7 quarts of skimmed milk and water, ¾ D. lb. meal, hay and a little oilcake; ninth week, water, ¾ D. lb. meal and hay, oilcake and turnips. The skimmed milk must be well boiled and given warm until the ninth week, after which time it is given colder by degrees. If the calves get diarrhœa, three table-spoonfuls of Danish corn-brandy, is given them daily. The meal, which is half barley and half oats, is at first mixed with warm water. The calves thrive well, and it is very seldom that any deaths occur.

The heifers are brought into the herd either as 3-year-olds, which calve in October to December, or as 2½-year-olds, which calve in April and May. Mr. Heide has made the following calculation of what it costs to bring up a heifer to the age of 3 years, when it is brought into the herd in the autumn and is to calve during November or December:—

	New Milk.	Skimmed Milk.
	lbs.	lbs.
1st week, 7 days, at 12 lbs.* new-milk .. .. per diem	84	..
2nd ,, 7 ,, 12 ,, ,, and 4 lbs. skim-milk	84	28
3rd ,, 7 ,, 10 ,, ,, 10 ,, ,,	70	70
4th ,, 7 ,, 6 ,, ,, 18 ,, ,,	42	126
5th ,, 7 ,, 6 ,, ,, 28 ,, ,,	..	196
6th ,, 7 ,, 6 ,, ,, 32 ,, ,,	..	224
7th ,, 7 ,, 6 ,, ,, 24 ,, ,,	..	168
8th ,, 7 ,, 6 ,, ,, 16 ,, ,,	..	112
Total	280	924

* Danish lbs.; add one-tenth to ascertain the weight in English lbs.

	£	*s.*	*d.*			
Calculating the new milk at 2 sk. per D. lb. (about ½*d.* per English lb, or 5*d.* per gallon), and the skimmed milk at ½ sk. per D. lb. (or 1¼*d.* per gallon), a calf when two months old will cost ..	1	3	8½			
During March, April, and May the food consists of 1 D. lb. meal daily = 90 D. lbs. meal at 3 sk. (100 lbs. at ¾d.)	0	6	3			
¼ skp. (⅛ bushel) turnips = 3 brls. turnips at 3 marks	0	3	4½			
3 D. lbs. hay = 270 D. lbs. hay at 1 sk. (300 lbs. at ¼d.)	0	6	3			
On the 1st June the calf, at five months old, has cost				1	19	7

	£ s. d.	
Brought forward	1 19 7	
Grazing during the summer, or fodder in the stable, ¼ td. ld.	0 16 9	
On the 1st November, when ten months old, the calf has cost		2 16 4
Keep during the winter for 200 days, viz.:		
4 D. lbs. hay per diem = 800 D. lbs. at ¾ sk. (8 cwt. at 1*s.* 9*d.*)	0 14 0	
¾ skp. turnips, in all 20 brls., at 40 sk.	0 18 7	
1½ D. lb. meal, in all 300 D. lbs., at 3 sk. (3 cwt. at 7*s.*, nearly)	1 0 10	
On the 1st June, when the heifer is a year and a-half old, it has cost		5 9 9
Grazing during the summer, or fodder in the stable, 1 td. ld.	1 2 3	
On the 1st November the two-year-old heifer has cost		6 12 0
Keep during the winter for 200 days, viz.:		
6 D. lbs. hay, in all 1200 D. lbs., at ¾ sk. (12 cwt. at 1*s.* 9*d.*, nearly)	1 0 9	
1 skp. turnips = 25 brls., at 40 sk.	1 3 0	
2 D. lbs. meal = 400 D. lbs., at 3 sk. (4 cwt., at 7*s.*, nearly)	1 7 9	
On the 1st June, when the heifer is two and a-half years old, it has cost		10 3 6
Grazing during the summer, or fodder in the stable, ½ td. ld.	1 13 6	
On the 1st November, when three years old, the heifer has cost		11 17 0

In the autumn the cows are housed at night for some weeks before they are kept in altogether, and those that give milk get their 3 D. lbs. of bran or coarse meal, besides hay, straw, and turnips. In the spring, when the cows are first put on grass during the day, they go under roof at night, and get then the same allowance of bran, meal, hay, straw, and turnips; but after a few days they refuse the bran and meal, while they greedily consume the hay, straw, and turnips. In 1872 the cows were put on grass on the 12th of May, and until the 16th of May they consumed in the stable at night 8½ cwt. of artificial food, and 51 bushels of turnips. On the 30th of August they were again put into the stable at night; and until the 24th of October, when they were kept in altogether, they consumed in the stable at night 41 cwt. of artificial food, besides hay and straw. This manner of feeding the cows at night in the stable answers very well. When the grass is scarce in the summer, as was the case in 1868 and 1870, some bran and coarsely ground meal is given to the cows in the water they drink.

During last winter (1873) the following fodder per cow daily, besides straw, was given to the milking-cows:—

18 D. lbs. meadow- or clover-hay,	equal to	14—16	D. lbs. best hay.
2 skpr. turnips and carrots	„	12—13	„
2 D. lbs. mixed corn-meal	„	4— 5	„
¾ D. lb. rape-cake	„	2— 2¼	„
1½ D. lb. palm-cake	„	3— 4	„
2 D. lbs. bran	„	4	„
Total		39—44¼	D. lbs. best hay.

Later on the cows got only clover-hay and an additional 2 D. lbs. of coarse meal, which made the daily fodder equal to 45—51 D. lbs. of hay. The meal was about one-fourth rye, one-fourth barley, and the remaining half a mixture of barley, oats, and tares.

The order of feeding is as follows:—

At 5 A.M. hay is given; sweeping and milking are done.
At 7 A.M. water is given in the troughs, which are emptied before next feeding-time.
At 7.30 A.M. artificial food (meal, oil-cakes, &c.) is given, mixed with a little chaff and cut turnips. After that the stalls are cleaned.
From 9 until 11 A.M. the stalls are closed.
At 11 o'clock a large allowance of spring-corn straw is given. After that milking takes places, and the sheds are closed.
At 1 P.M. hay is given, and sweeping is done.
At 2.30 P.M. watering takes place.
At 3 P.M. artificial food is given again, after which the stalls are cleaned.
From 4 until 6 P.M. the cow-sheds are closed.
At 7 P.M. a large allowance of straw is given, generally of winter corn, the cows are milked, and the stalls are swept.

In the spring an extra portion of hay is given in the afternoon.

All the turnips and artificial food, with a little chaff, are mixed together in the fodder-box, where it all remains from eight to sixteen hours until it is used. By this means the turnips are prevented from freezing, and the fodder takes up less room.

Last year the following quantities, besides straw, were consumed by the milking-cows, of which there were an average of thirty-six:—

	£	s.	d.
24,553 D. lbs. meal, at 3 sk. (= nearly 243 cwt., at 7*s.*)	84	18	3
18,678 D. lbs. bran, at 2½ sk. (= 135 cwt., at 5*s.* 10*d.*)	54	0	9
5,532½ D. lbs. rape-cake, at 3¾ sk. (= about 54¾ cwt., at 8*s.* 9*d.*)	23	19	6
10,219 D. lbs. palm-cake, at 3 sk. (= nearly 101½ cwt., at 7*s.*)	35	9	6
Total for artificial food	198	8	0
1377⅜ tdr. turnips, at 40 sk.	63	15	3
403½ tdr. carrots, at 40 sk.	18	11	6
90 loads of hay, at 9 rdls.	90	0	0
Total	370	14	9

Each milking-cow thus received, on an average, artificial food to the value of 5*l.* 10*s.* 3*d.*; roots and hay to the value of 4*l.* 15*s.* 9*d.*, or, altogether, fodder to the amount of 10*l.* 6*s.*

This calculation, however, is based upon thirty-six milking-cows, and if the food of an average of four cows not giving milk be added to the foregoing list, the value of the fodder per milking-cow will be about 10*l.* 13*s.* 6*d.*

The cows not giving milk, the bulls, the heifers, and the calves, received daily the following quantities of fodder :—

8 D. lbs. of hay	equal to	7 — 8	D. lbs. best hay.
1 skp. turnips	„	6 — 6½	„
⅛ D. lb. rape-cake	„	0¼— 0⅓	„
¼ D. lb. palm-cake	„	0½— 0⅔	„
1½ D. lbs. bran of wheat	„	3 — 3½	„
In all equal to		16¾—19	D. lbs. best hay.

Later on, the older bulls received more meal. The quantity of hay, however, did not exceed 8 D. lbs. per day for the cows not giving milk, the bulls, and the older heifers; the young bulls and the yearling heifers received only 6 D. lbs. of hay, and the calves about 3 D. lbs. per day. In this division there were, besides the four dry cows already mentioned, two old bulls (4 and 3 years), two younger ones (1½ year), seventeen 2- and 3-year-old heifers, and eleven calves.

These consumed :—

	£	s.	*d.*
3328½ D. lbs. meal, at 3 sk. (= 33 cwt., at 7*s.*) .. .	11	11	3
8024 D. lbs. bran, at 2½ sk. (= 80 cwt., at 5*s.* 10*d.*) ..	23	4	9
974½ D. lbs. rape-cake, at 3¾ sk. (= nearly 9¾ cwt., at 8*s.* 9*d.*)	4	4	6
1072¾ D. lbs. palm-cake, at 3 sk. (= nearly 10¼ cwt., at 7*s.*)	3	14	6
Total for artificial food	42	15	0
361⅝ tdr. turnips, at 40 sk. (superior)	16	14	6
149 tdr. carrots, at 40 sk.	6	18	0
237⅝ tdr. turnips, at 2 marks	8	15	9
55 loads of hay, at 6 rdr.	36	13	6
Total	111	16	9

Each head, large and small, in this division, thus consumed artificial food to the value of 1*l.* 3*s.* 6*d.*, turnips and hay to the value of 1*l.* 18*s.* 6*d.*, or, altogether, fodder to the amount of 3*l.* 2*s.*

Besides the cast-cows, which are milked while they are being fattened, from eight to ten cattle have been annually fattened of late years. It is intended in future to fatten from eighteen to twenty cattle every year in two divisions: the first will begin during the latter part of September, so as to be disposed of for Christmas or January, and the second, consisting partly of working-oxen used in the autumn, will be put up to feed in the spring.

During last winter (1873) three Jutland and five Swedish bullocks, and also one bull taken out of the herd, were fattened. During the first and second month the fodder was increased to—

10 D. lbs. hay	equal to	8—10	D. lbs. best hay.
½ td. turnips (nearly 2 bushels) ..	„	14—15	„
¾ D. lb. rape-cake	„	2— 2¼	„
2 D. lbs. palm-cake	„	4— 6	„
2 D. lbs. bran	„	4— 0	„
2 D. lbs. meal	„	4— 6	„
In all equal to		36—43	D. lbs. best hay.

Later on, only 2 skpr. turnips were given daily, but besides that, 1½ D. lb. of linseed-cake, and in all 6 D. lbs. meal, were given daily, and increased by degrees, by which the equivalent of the food in hay was increased to from 40 to 52 D. lbs. per day. The total quantity consumed in the feeding-stable was as follows:—

	£	s.	d.
5256 D. lbs. meal, at 3 sk. (= 52 cwt., at 7*s.*)	18	5	0
2862 D. lbs. bran, at 2½ sk. (= 28½ cwt., at 5*s.* 10*d.*) ..	*7	2	6
984 D. lbs. rape-cakes, at 3½ sk. (= 9¾ cwt., at 8*s.* 2*d.*)	3	19	6
2664 D. lbs. palm-cakes, at 3 sk. (= 26½ cwt., at 7*s.*) ..	9	5	0
932½ D. lbs. linseed-cakes, at 4 sk. (= 9¼ cwt., at 9*s.* 4*d.*)	4	6	3
168 D. lbs. peas, at 3 sk.	0	11	9
538½ tdr. turnips, at 2 marks	19	19	0
5 loads hay, at 6 rdlr.	3	6	9
Total	66	15	9
The cost price of the—			
Three Jutland bullocks was	32	9	0
Five Swedish „	48	18	0
One bull „	13	6	6
Total	94	13	6
The cost of the fodder was	66	15	9
Total cost of the beasts when fat	161	9	3
Total sold	159	0	6
Loss by feeding	2	8	9

The weight of the cattle when bought in was as follows:—

Three Jutland bullocks, 2713 D. lbs., costing 32*l.* 9*s.*, or 1*s.* 9*d.* per stone of 8 lbs. live weight.

Five Swedish bullocks, 4395 D. lbs., for 48*l.* 18*s.*, or 1*s.* 7½*d.* per stone.

One bull, 1350 D. lbs., for 13*l.* 6*s.* 6*d.*, or 1*s.* 5¼*d.* per stone.

Eight bullocks were sold at 6*s.* 4½*d.* per lpd. (= 16 D. lbs., or rather more than 2 stone), and the bull at 4*s.* 1½*d.* per lpd. living weight; the bullocks weighed about 8800 lbs. English, and fetched 138*l.* 15*s.* 6*d.*, or 2*s.* 6¼*d.* per stone live weight. The bull weighed 1750 lbs. English, and was sold for 20*l.* 5*s.*, or 1*s.* 10*d.* per stone. The increase of weight on the bullocks from the 20th of November to the 4th of April was thus in all 974 lbs. English, or 121¾ lbs. each, and on the bull 265 lbs.

Last year (1873) the total quantity of milk produced from forty cows was 26,430 galls., namely, in the stable 14,430 galls., and on grass 12,000 galls.

The income and expenses of the cows last year (1873) were as follow:—

Expenses.—Winter Fodder.

	£	s.	d.
a. Milking-cows:			
90 loads of clover and meadow-hay, at 1*l.* ..	90	0	0
Artificial food	198	8	0
Turnips	82	9	0
b. Cows not giving milk, bulls, and young cattle:			
55 loads meadow-hay, at 13*s.* 6*d.*	36	13	6
Artificial food	42	15	0
Turnips	32	8	3
Milk for the calves	38	16	6

Total expenses 521 10 3

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* This calculation is rather more than a sovereign too little, but I have kept it as in Mr. Heide's published accounts, where it stands for 64 rdlr. 11 sk.

Grazing in the Summer.

	£	s.	d.	£	s.	d.
Milking-cows, bulls, and young cattle:						
a. The Upper Farm.—5 fields of grass and clover (43 acres), on which was made 85 loads of clover-hay, equal to 11 acres, leaving nearly 32 acres, at about 2*l.* 18*s.* 6*d.* per acre, equal to	93	6	6			
b. The Lower Farm.—2 fields of grass and clover, at 9 acres, making 18 acres, from which deduct for grazing of eight horses two to three months 4½ acres, leaving 13½ acres; add autumn grazing of St. John's Rye 6¾ td. ld., equal to 2½ acres—total 16 acres, at about 33*s.* 6*d.* per acre	26	13	6			
Total				120	0	0
The expenses for grazing are, thus, 3*l.* per cow; the grazing of the young cattle for five or six weeks with the cows, and the rest of the time in the meadows, is calculated at	27	15	9			
Total for summer-grazing being				147	15	9
Total expenses for winter and summer being ..				669	6	0

Receipts.

	£	s.	d.	£	s.	d.
For supplies to the house	29	17	0			
„ rearing calves	38	16	6			
„ butter	474	12	9			
„ cheese	50	16	3			
Surplus for the pigs	128	18	0			
Cast-cows, calves, hides, and skins	130	18	0			
Total receipts				853	18	6

This leaves, thus, a balance of 184*l.* 12*s.* 6*d.*, which is 4*l.* 12*s.* 3½*d.* per cow; and if 3*l.* 6*s.* 9*d.* be deducted for working-expenses, the balance of nett profit per cow is 1*l.* 5*s.* 6½*d.*

The pigs are of the large Yorkshire breed, and are very productive. During the years 1871 to 1873 seventy-five pigs were fattened, which weighed in the aggregate nearly 16,000 English lbs., or an average of 213 lbs. They realised 266*l.* 19*s.* 6*d.*, being an average of 3*l.* 11*s.* 3*d.*, or 2*s.* 8*d.* per stone of 8 lbs. live weight. Besides these, five porkers were sold for 6*l.* 18*s.*, thus increasing the total to 273*l.* 17*s.* 6*d.*

Besides the butter-milk, whey, and skimmed milk, the following articles of food were consumed by pigs:—

	£	s.	d.
16,864 D. lbs. meal, at 3 sk. (= nearly 108 cwt., at 7*s.*)	58	12	6
600 D. lbs. bran, at 2½ sk. (= 6 cwt., at 5*s.* 10*d.*) ..	1	14	6
1512 D. lbs. palm-cake, at 3 sk. (= 15 cwt., at 7*s.*) ..	5	5	6
1755 D. lbs. peas, at 3 sk. (= 17½ cwt., at 7*s.*)	6	1	9
1378 brls. carrots, at 40 sk.	63	16	3
100 brls. turnips (superior), at 40 sk.	4	12	6
130 brls. turnips, at 32 sk.	4	16	3
Total	144	19	3

If this amount be deducted from the receipts (273*l.* 17*s.* 6*d.*) mentioned above, there will remain a balance of 128*l.* 18*s.*, which, as stated in the items of receipts, is taken as payment for the milk used. The turnips given to the pigs are steamed, and when the frost is very severe the fodder and the drinking-water given to the cattle are warmed.

No pigs are bought, but the stock is kept up by breeding. The number is generally seventy, large and small.

Besides a steward and a dairy-maid (who is also housekeeper, and is partly paid by percentage), the hands kept on Kjærsgaard consist of three unmarried farm-labourers living on the farm, whose wages vary from 6*l.* to 9*l.* per annum; one boy; one man to feed the cattle (wages 9*l.*); one man to feed the cattle that are being fattened during the winter (wages 4*l.* 10*s.*); one man to feed the pigs, and who attends to the steam-boiler (wages 10*l.*); one kitchen-maid, who also does the brewing (wages 6*l.* 13*s.* 6*d.*). The brewing and baking are done on the farm. The man who looks after the pigs receives an allowance of 2*d.* for every pig fattened, and 4½*d.* for every pig born living; an allowance is likewise given for every beast fattened. The work in the dairy is done by three apprentices, who pay 2*l.* 15*s.* 9*d.* per annum each. One farm-apprentice pays 5*l.* 11*s.* 3*d.* per annum. The people get no spirits in the winter, but twice a day from the 1st of April to the 1st of November.

The day-labourers, of whom four are kept, keep themselves, but receive beer gratis. The pay per day from November to February is 1*s.*; during March, September, and October, 1*s.* 1½*d.*; during April and May, 1*s.* 3*d.*; and during June, July, and August, 1*s.* 6*d.*; but from the 1st of April to the 1st of November, 2*d.* per day is retained, and is not paid before the 1st of November. The day-labourers, however, often do piece-work; for instance, the turnips are generally taken up, loaded, conveyed, laid down, and covered by agreement; and the conveyance and spreading of the manure are done under the same kind of arrangement.

Dairy Husbandry.—The reader of this Report should now be impressed with the importance of this branch of agriculture in the kingdom of Denmark. It prevails almost exclusively on the eastern side of Jutland, and throughout the islands of Fyen and Sealand; and it is also general on Falster, Laaland, and the smaller islands, although feeding farms also occur on the good grass-land bordering the shores of those fertile pendants of the Danish monarchy. The rotations already given (excluding those pursued by Mr. Trohldahl and Lieut. Mansa), and the remarks already made on the cultivation of the land, apply strictly to the dairy-farming of the kingdom; permanent pasture being by no means essential to the possession of a good herd, or to the manufacture of high-class butter. No doubt, the possession of a considerable acreage of permanent grass enables its owner to grow a relatively larger breadth of corn on his arable land. Indeed, if he is to use his grass to the best advantage in the summer, he must grow a large acreage of barley and oats to enable him to keep his dairy-stock through the winter, when their food consists to a large extent of spring-corn.

The favourite breed of cattle in the dairy districts is the Angeln, and it appeared to me quite worthy of the pride and the preference with which it is regarded by Danish dairy-farmers.

The following description of its characteristic features is taken from M. Tisserand's 'Études économiques sur le Danemark,' a work of great research, characterised by the distinguished author's usual ability, although, as will have been noticed, I have not been able to endorse all his conclusions:—

> "This race is of small size, and cannot be compared with any breed more closely than with the Ayrshire, whose qualities and size it partakes. The colour of the Angeln cows is red, sometimes bright and clear, sometimes deep and even dark, often being spotted with white;* and the hair is generally tipped with a dark colour. The skin is thin and supple; and all the cattle have the distinguishing characters of good milkers.
>
> "Head somewhat delicate, although bony; looked at in profile it has a pyramidal form, and shows a large brow, nostrils well open, and a somewhat straight forehead; lower jaws very divergent, eyes docile and lively, horns long, thin, and well placed; neck long and very slender; back not always perfectly straight; back-bone projecting, and brisket girthing most behind the shoulders; hind-quarters roomy, udder large and well placed, and the milk-vein generally very much developed; legs and tail very slender; flanks hollow, and bones projecting.
>
> "The Angeln cow presents, in fact, all the characters and all the defects of a good milking breed; its body has the form of a pyramid, of which the base is formed by the hind-quarters, and the summit by the fore-quarters, which are very slight. While in-milk the cow remains very thin; not only does it convert all its food into milk, but it appears also to perform the same operation with the fat and muscles of its own body; but when it runs dry it fattens easily.
>
> "The Angeln breed may, in fact, be regarded as one of the best milking-races in existence. The average weight of a cow is from 7 to 8 cwt., and its annual milk produce is very nearly 440 gallons."

This breed had its origin in the district from which it takes its name, and which is situated between the Gulf of Flensburg and the Schley. Of late years the demand for these cattle from their native district, where they are presumed to exist in the pure state, has been so great, that the peasants have been tempted to purchase animals of more or less doubtful descent from the immediately surrounding districts (to which the breeding of Angeln cattle first extended), and to sell them as true Angelns of their own breeding. It is thus very difficult to obtain, with any certainty, pure-bred Angeln cattle from their original home; and the only way in which it can be accomplished is by personal search amongst the peasantry, and careful verification of the history of the animals offered for sale.

Considering the estimation in which this breed is held, and the difficulty experienced by dairy farmers who understand the value of an infusion of new blood, which is only to be obtained by securing fresh bulls of undoubted purity, it seems somewhat remarkable that no Angeln Herd-book has yet been established. It is true that Mr. Heide has agitated the question for some time; but his suggestions do not seem to have met with much

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* The white spots are now considered a defect, and indicative of impure lineage.—H. M. J.

Fig. 5.—*Young Bull of the Angeln Breed.*

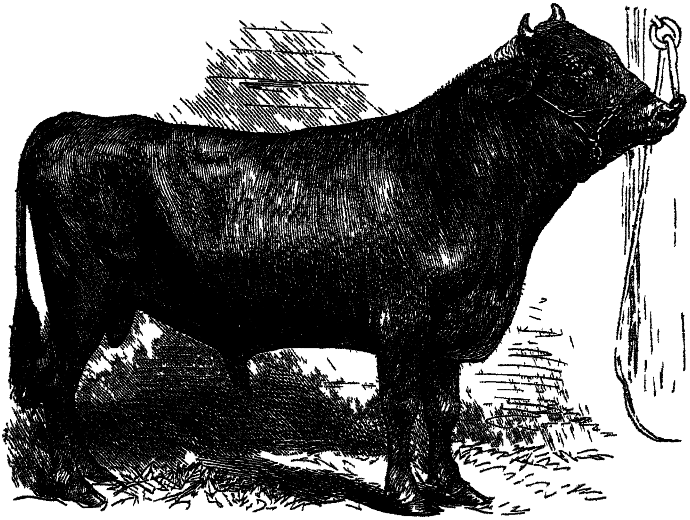
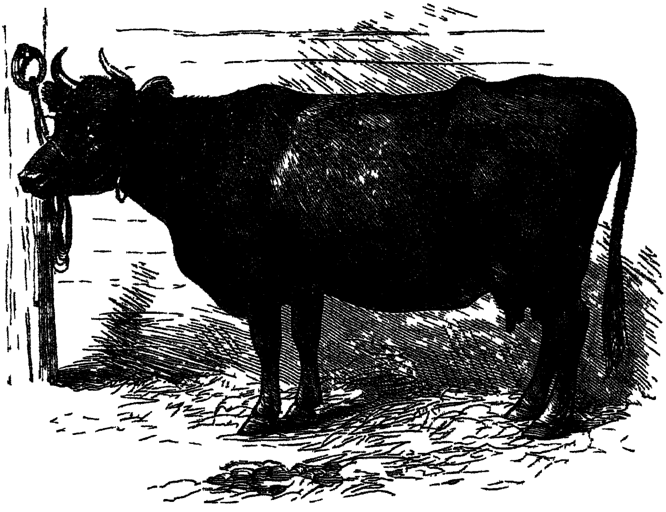


Fig. 6.—*Cow of the Angeln Breed.*



support from even large proprietors, although they acknowledge their greatest and increasing difficulty to be the acquisition of good bulls of pure lineage.

Taking the general run of even the large proprietors, not more than 10 per cent. of the cows go out of the herd every year; but some few of the more advanced, like Mr. Vallentiner, send out one-fifth or one-sixth. The cast-cows are fed off at about 12*l.* to 14*l.* per head; and farmers who have abundance of fodder, and who grow a few roots, generally prefer to buy old cows from the surrounding peasants than to supply themselves with store-steers from Jutland, which are considered to be sold too dear to leave any profit for feeding.

Heifers are generally put to the bull at 15 months old, and calves begin to drop soon after the cows go into the stalls in October. The best farmers allow their cows to run dry for about six or eight weeks before calving, and afterwards feed them well with oats and a little barley, hay, and a small quantity of roots, where they are grown, especially mangolds, which are preferred to turnips. A little rape-cake is also considered to improve the flavour of the butter, but it must be given with some caution, and the quantity should not exceed 1 lb. per head per diem. In the month of May the cows are turned out on the seeds. The permanent grass, where there is any, is preserved for hay, and only the aftermath is fed. The cows are tethered in lines,* and on a large and well-managed farm a straight row of 150 or 200 cows of a uniform red colour forms a striking introduction to an inquiry into the method of farming there pursued. The yield of milk, and the quantity and quality of its products, necessarily vary; but on well-managed peasant-farms on the island of Falster I found a recorded average of more than 500 gallons of milk per head per annum, which, at the rate of 30 lbs. of milk to 1 lb. of butter, would give a produce of about 170 lbs. of butter per cow per annum. The accounts kept by Mr. Consul-General Pontoppidan at his home-farm of Constantinsborg, near Aarhuus, show that he obtains over 180 English lbs. of the best-quality butter and 260 lbs. of skim-cheese per cow per annum. The butter fetches 1*s.* 4*d.* per lb. avoirdupois, and the skim-cheese nearly 4*d.*, giving a total of, say, 16*l.* per cow, in addition to the sale of a certain quantity of buttermilk-cheese at 5*d.*, per lb., and the use of the refuse towards feeding nearly 1 pig to the cow. This statement is borne out by the accounts of Mr. Tesdorpf, which show that on his farm, at Ourupgaard, the total gross receipts for butter, cheese, and refuse-products utilised in feeding pigs, amount to 20*l.* per cow per annum, and Mr. Heide's accounts, given on p. 342, show a return of 16*l.* 10*s.* per cow, besides house-supplies, milk for calves, cast-cows, &c.

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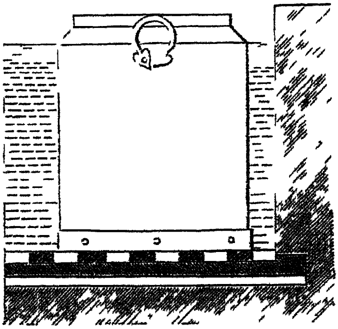
* The cows are tethered by a thin iron chain, 20 feet long, or by an ordinary rope, which is fastened to a stake in the ground. The stake is either of wrought iron, with a ring above, or of strong beechwood. In case the rope should become twisted, it has a swivel-link in the middle. On the head of the cow is placed a holster, generally consisting of two wooden side-pieces, with a thin cord over the nose and also behind the horns, the thick rope being drawn through the hindermost part of the holster-pieces. Mr. Consul-General Westenholz does not tether his cows, but 160 of them together are efficiently herded by a man and a dog.

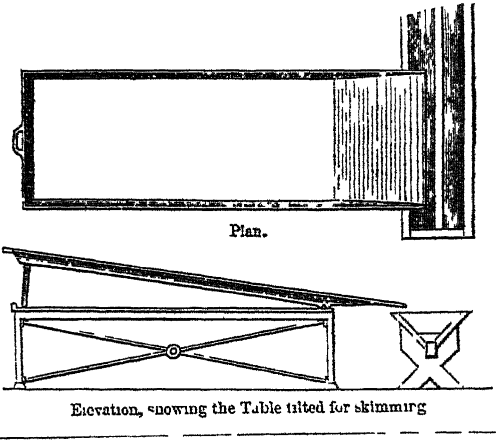
On well-managed dairy-farms, where sweet-cream butter is made, the milk is set in deep round or oval cans, placed in pools of mixed ice and water, or of running water obtained from a stream which has been directed through the milk-house, in the middle of which it is expanded into a tank. The annexed cut (Fig. 7), showing a milk-can in the tank, gives an idea of the nature of the tank and of the vessels employed.

Fig. 7.—*Section of part of the Tank in the Milk-house on Mr. Vallentiner's Farm at Gjeddesdal, Sealand, showing one of the Milk-cans immersed in iced water.*



In Holstein, where the old system of making butter from sour cream still prevails, shallow oblong enamelled-iron tables (Fig. 8), are used for setting the milk, as they were many years ago. When the milk

Fig. 8.—*Plan and Elevation of the Holstein Milk-setter.*[*]


Plan.

Elevation, showing the Table tilted for skimming is ready to be skimmed, the tables are tilted at the back by means of a small screw-jack, and the cream is then drawn into a trough by a skim-scraper (Fig. 9), which travels on rollers on each side of the table.

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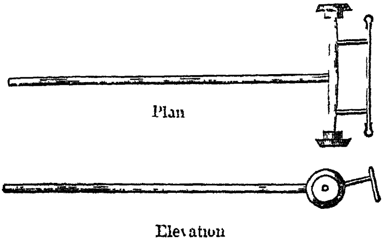
[*] For these and several other sketches I am indebted to my friend Mr F Wilton, Resident Engineer of the East London Railway

Fig. 9.—*Plan and Elevation of the Skimmer used with the Holstein Milk-setter in Mr. Westenholz's Dairy, near Horsens, Jutland.*



The temperature of the water at Mr. Pontoppidan's was about 48° Fahr. The milk is set for 24 to 36 hours, and the cream is churned sweet, by horse-power—or steam-power on large establishments—immediately after the skimming, and at a temperature of about 54½° Fahr. On an average, 30 lbs. of milk will yield 1 lb. of butter and 2 lbs. or more of skim-cheese. The temperature of the water at Mr. Vallentiner's, which was obtained from a well 60 feet deep in the chalk, was about 45° Fahr., and the milk was skimmed a first time after standing 24 or 36 hours as usual, but it was also skimmed a second time before cheese-making. By this economy Mr. Vallentiner obtains about 1 lb. of butter for about 27 lbs. of milk, and his estimate of the gross value of the produce of an average cow is 17*l.* per annum, taking into account butter, cheese, and whey.

Little need be said in reference to skim-cheese manufacture. The skim-milk is raised to about 88° Fahr., and the rennet then added; it is kept at this temperature for about half or three-quarters of an hour, and then raised to 98° Fahr., at which it is kept for a few minutes and the whey let out. The cheeses are pressed for 24 hours, and lever-presses and other dairy implements of the best type are seen in the dairies of most of the large proprietors.

In my Report on Norway and Sweden I gave figures and a description of a circular butter-making machine,* which is occasionally seen on large dairy-farms in those countries, and is extensively used in Denmark. Machines of this kind are manufactured by Messrs. Caroc and Leth, of Aarhuus, and by Messrs. Hassel and Teudt, of Copenhagen. For farm purposes, machines having a diameter of from 30 to 45 inches are most in request, and cost from 6*l.* to 12*l.* each according to the size. They are capable of making from 1 to 2 cwt. of butter per day, each machine requiring the attention of only one dairymaid. For smaller occupations, a straight machine (Fig. 10), on the same principle, but of more simple construction (Steenstrup's patent), is manufactured by Messrs. Caroc and Leth, of Aarhuns, and by Messrs. S. H. Lundh and Co., of Christiania. It will "make" about 20 lbs. of butter daily, with very little labour on the part of the dairymaid, and its price is from 16*s.* to 30*s.* The process of "making" consists in passing the butter under the grooved roller, thus expressing the buttermilk, which runs off along the grooves on each side of the machine.

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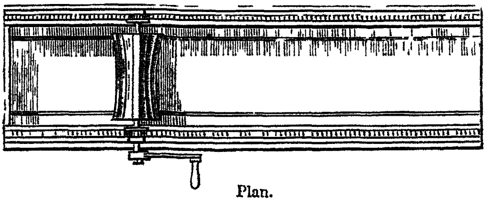
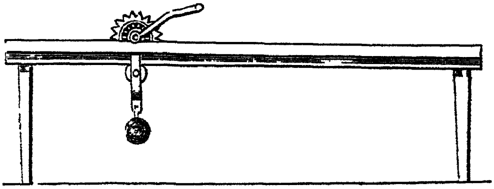
* 'Journ. Roy. Agric. Soc.,' Second Series, vol. xi., Part I., 1875, p. 225.

Fig. 10.—*Plan and Elevation of a Butter-making Machine used on Mr. Schestedt-Juul's Farm at Ravnholdt, in the Island of Fyen.*



Plan.



Elevation.

In the Report by Mr. Rainals, dated May, 1860, it is stated that "the butter, or the article sold in the market by the yeomen-farmers under that name, is execrably bad; it is strongly salted with the commonest salt, whilst in its preparation so little regard is paid to the proper extraction of the whey (*sic*), or even to cleanliness, that it appears strange that such produce can find a sale." All this has been changed, owing to the scientific exertions of Professor Segelcke, and the practical aid of Mr. Friis, of Lillerup. Professor Wilson has indicated in his Report * the efforts and the improvements made by these gentlemen in the *rationale* of butter-making, so I will content myself by giving a brief sketch of an institution established at Copenhagen on the factory principle, by means of which the best Danish butter commands high prices in all quarters of the globe, and is sold in London in 1-lb. tins at 1*s.* 10½*d.* per lb., in quantities of not less than 100 lbs. This institution is popularly known as the Scandinavian Preserved Butter Company, and trades under the style and title of Messrs. Busck, jun., and Company. It was established in 1863, and has a subscribed capital of about 25,000*l.* Its chief business is to manufacture first-class butter, and pack it in tins for exportation. Most of this "tinned" or "preserved" butter comes to England for re-exportation to Brazil, India, and other tropical countries, for which purpose it fetches the high price just named. The premises, machinery, and organisation of the Company enable it to tin and turn out about 10 tons of butter per diem, therefore it may be of interest to English dairy-farmers to learn the precise manner in which this result is arrived at.

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* 'Journ. Roy. Agric. Soc.,' Second Series, vol. iv., Part II., 1868, p. 317.

The Company has contracts with a large number of dairy-farmers in Denmark and the south of Sweden, probably with not less than 150 in the Danish monarchy alone, to the effect that they agree to deliver practically the whole of their butter to the Company at stated times; the butter to be made and packed according to the regulations laid down by the said Company. The chief features of the regulations are that the butter must be made from sweet cream, the whole of the buttermilk must not be expressed, and the butter must be packed in kegs properly prepared with a certain amount of salt upon the textile lining.

Mr. Consul-General Westenholz has kindly favoured me with the following note on this establishment, and the process of butter-making, which it has recently prescribed :—

> Mr. Busck, jun., who labours most indefatigably in what he has made his speciality, hired about three years ago from me premises on a farm "Kaningaarden," on my estate of Dronninggaard, 12 miles from Copenhagen, and bought the milk produced on my home-farm by an average of 150 milking-cows, and established a school for teaching dairy-women, as well as for experiments with regard to obtaining the very finest produce.
>
> According to the system to which Mr. Busck has come, and which is now prescribed by the Company for all first-class "packing-butter," the milk, set in small deep round cans (Fig. 7, p. 347), is placed in the tanks, which are then filled with ice (broken to pieces not much larger than walnuts) and cold water, the temperature of the milk being thus at once reduced to the lowest possible degree, say 40–45° Fahrenheit. After twelve hours the milk is skimmed and the cream immediately churned. When found inconvenient to churn twice a day, the cream, skimmed in the evening, is put in similar tin cans in ice and water, and thus kept till morning, when churned along with the morning cream. Cream from milk that has stood longer than twelve hours is on no consideration allowed to be used for first-class "packing-butter."
>
> This system, of course, cannot be carried out without ice, as no stream of water could reduce the temperature of the milk so speedily and so much as the ice, so as to bring all the cream to the top in the prescribed twelve hours.
>
> On this new system, "ice, twelve hours' skimming and sweet-cream churning," one may reckon, on an average, 30 lbs. of milk to yield 1 lb. of first-class packing-butter, the present value of which is 1*s.* 6⅔*d.*, and say about 2¾ lbs. of cheese, worth at least 1*s.*, total 2*s.* 6⅔*d.*; while on the plan of skimming after twenty-four or thirty-six hours without ice, one cannot calculate on more cream, while the value of the pound of butter is at present not above 1*s.* 4*d.*, and the common skim-milk cheese from the stale milk only 7*d.* to 8*d.*, showing 20 per cent. in favour of the new system, which, of course, entails the expense of storing and preserving ice, but, on the other hand, in many respects saves labour, and gives a certainty of a uniform and superior quality, both of butter and cheese.

The following are the essential features of the process of butter-making, which is, I believe, generally adopted in the country : [*]—

"In order to get the best-quality butter, the cream must be churned sweet, immediately after the milk has been skimmed. Nevertheless, in order to obtain the maximum quantity of butter, the milk should be allowed to set thirty-six hours, and should be skimmed every twelve hours; therefore in the summer this double result can only be obtained in dairies where the milk-houses are well supplied with cold water. In other cases the cream must be churned sour in the ordinary manner. Even then, it should not be allowed to sour more than possible, but should be churned quickly, while the souring-process is in its earlier stages.

"Butter should be made daily, as far as possible.

"The addition of newly milked milk to the cream ought to be avoided in summer, so far as this is not indispensable to daily butter-making.

"The simple Holstein churn is used; it is provided with a dash-board, which consists only of a narrow frame without central ledges. The cream ought not to occupy the churn to a greater height than from 3 to 6 inches, according to the size of the churn, below the uppermost cross-piece of the dash-board.

"If the cream is too cold when the churning commences it should be raised to the proper temperature (54½° to 59° Fahr.) by placing it in a vessel made of tin or tinned copper, which has been placed in a tub filled with water warmed to a temperature of 100° to 120° Fahr. If the cream is too warm, it must be cooled in a similar manner by placing the vessels which contain it in spring- or ice-water.

"Churning should not occupy more than from 30 to 40 minutes. In a churn having a capacity of 60 gallons, the spindle should make about 120 revolutions in a minute, and in a small churn it may make as many as 200. During the churning the temperature should not increase more than 4½° Fahr.; and by ascertaining this by actual test, one is enabled to determine either that the velocity of the spindle must be reduced, or that the cream must be brought to a lower temperature before the commencement of the churning. Only in the most urgent cases ought cooled skim-milk to be used for reducing the temperature of the cream, and under no circumstances whatever should water be mixed with it.

"After the butter has been weighed, salt is added, at the rate of ½ oz. per lb. The addition of the salt is managed by sprinkling a certain quantity upon the upper surface of each piece before the next is placed upon it.

"The butter is then left in lumps (not beaten into smooth pieces), in a well-ventilated, airy place, from two to five hours, according to the time of year, until it has become firm. The further working of the butter is then finished, generally by passing it eight or ten times under the roller of the circular butter-machine, or in smaller dairies under the similar roller of the straight butter-table (Fig. 10), which costs about 11*s.* 3*d.*[†] After each passage under the roller the butter should be made up again and re-pressed. When the butter-milk is in this manner sufficiently pressed out, a bright milky-white brine appears. The butter is then immediately packed up, being thoroughly well pressed into the cask with the fist."

As an example of a dairy-farm of the best class, I will take one of the properties of Mr. Tesdorpf, in the Island of Falster.

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[*] I am indebted for this statement to the work by Messrs. Petersen, Boysen and Fleischman, which contains a German translation from the original Danish of Mr. Hans Broge, to whom I must also acknowledge my personal obligations for much practical information given me during my stay at Aarhuus.

[†] This price is thus given by Mr. Hans Broge, but I believe that it is too low for the present day.

The home-farm comprises nearly 1400 acres, and is surrounded by an estate of peasant-farms, which are gradually being purchased by their occupiers on easy terms, as the proprietor encourages his tenants to purchase their holdings.

The home-farm, or Hovedgaard, at Ourupgaard, is near Nykjöbing, and consists of very fertile land, as does most of the island. There is no permanent grass, but the shift, which is of seven years, includes two years' seeds, as follows:—(1) Bare Fallow; (2) Wheat; (3) Barley, sometimes Oats; (4) Green-crops and Pulse, viz., turnips, beans, and peas; (5) Oats, sometimes Barley; (6) and (7) Seeds, mown and grazed according to circumstances. The herd consists of 220 Angeln cows of the best type, one-seventh being drafted every year. All the calves are reared; the best are selected for the herd, and the remainder find a ready sale at a few weeks old to the neighbouring farmers, as they are of much better quality than the common cattle of the country. Improvement has been one of Mr. Tesdorpf's chief objects in farming; and, in the selection of his calves for keeping up the herd, he has been eminently successful in attaining the object which he had in view, namely, their improvement as dairy cattle. His books have been kept with scrupulous care and minuteness, and show that the average production of butter and cheese per cow for periods of 10 years, during which the herd has ranged from 175 to 220 head, has been as follows:—

Year.	Butter in English lbs. per Cow.	Cheese in English lbs. per Cow.
1841	88·84	93·5
Ten years ending—		
1851	137·65	157·63
1861	171·25	196·9
1871	199·27	253 22
Year.		
1872	215·22	300·6
1873	210·1	275·
1874	200·2	220·1

On an average the cows yield about 700 gallons of milk per head per annum. After the first calf they yield 100 gallons less than this; and they are at their best when about 6 or 7 years old. Cows drop their calves at 3 years old, and Mr. Tesdorpf has found this system more profitable than earlier breeding. The total produce of each cow now, including butter, cheese, and swine, he reckons at an average of nearly 20*l.* per annum.

A feeding-flock of 450 cross-bred Merino and Cotswold sheep are kept. They are bred on his other farms, and at Ourupgaard are kept on grass during the summer, and on roots, hay, and cake in the sheep-stables in winter. They clip about 4½ lbs. of wool once in the year, but the price is 50 per cent. higher than can be got for Danish fleeces.

The rotation, as given above, comprises three courses of cereals, viz., wheat, barley, and oats. Of these, the wheat and most of the barley are sold; and the oats, with some barley, are consumed on the farm, as well as the roots and pulse, and artificial food to the amount of about 10*s.* per acre. The expenditure on artificial manures is 15*s.* per acre, and this item would be very much larger but for the fact that 200 tons of green bones are bought every year, at 4*l.* 10*s.* per ton, for the whole of Mr. Tesdorpf's farms. These bones are crushed and dissolved at home, and are applied to every crop of corn, roots, and pulse. In addition to this, artificial food is given to the stock on the grass; therefore the statement that the average of the crops has nearly doubled since 1841 is not so incredible as might at first sight appear. The following Table shows the quinquennial averages for all kinds of corn since 1850:—

Periods.	Bushels per Acre.
1850–54	35¾
1855–59	37
1860–64	41¾
1865–69	46¼
1870–74	46½

These averages have been calculated by adding together the quantities of land sown with each kind of grain, on the one hand, and the several yields on the other, then dividing the latter amount by the former. The difference in result between this method and the more usual one is illustrated by the following Table, which shows the produce of each kind of crop per acre for the last five years, in imperial bushels per acre.

	1870.	1871.	1872.	1873.	1874.	Average.
Wheat	32	46¼	34¾	41½	42	39¼
Rye	41½	..	..	29½	22½	31
Barley	48	46	41¼	38½	48½	44½
Oats	61¾	61½	68½	54½	60¾	61½
Peas	38½	40½	45½	32½	24	36
Mixed corn	36¾	55	53½	56½	49	50
Beans	19	37	39	44	10	30
Average	39⅝	47¾	47	42½	36¾	42

The average crop of the last five years by this method is thus 42 bushels instead of 46½; but if there had been small acreages of kinds of grain which yield relatively heavy crops (such as oats and barley) instead of large ones, the difference of result would have been in the opposite direction.

Ourupgaard contains 1385 acres, assessed at 137⅛ tönder hard-corn; so that on an average there are 10 acres of land to 1 tönde hard-corn; and the rates and taxes amount, in the aggregate, to nearly 5*s.* 6*d.* per acre, or 55*s.* per tönde hard-corn. The expenditure for artificial manures in 1873 amounted to nearly 12*s.* 6*d.* per acre, and that for feeding-stuffs to not quite 10*s.* per acre. Putting together all the items that can be reckoned as labour-expenses, including the dairy, board of servants, tradesmen's bills, and wages, they bring the total cost of labour up to rather more than 50*s.* per acre.

Details of Expenditure on the Ourupgaard Farm in 1873.

	£	*s.*	*d.*
Wages and working expenses	1278	4	0
Horse bought	5	11	3
Machinery	223	10	3
Smith's work	191	12	3
Wheelwright	101	14	6
Saddler	40	5	9
Tailor	22	9	0
Sacks, &c.	16	14	0
Miscellaneous repairs	21	14	3
Board of servants and labourers	996	0	6
Rates and taxes	380	1	0
Draining	3	17	9
Artificial manures	855	12	0
Oilcake and bran	650	15	0
Clover and grass-seeds	99	17	0
Coal	182	12	6
Miscellaneous expenses	137	8	0
Artesian well-boring	72	13	0
Dairy expenses	871	3	9
	£6151	15	9

In the year 1873, Mr. Tesdorpf's sales from the Ourupgaard farm amounted to 76,100 rixdalers, or 6*l.* 2*s.* per acre; while the payments reached the sum of 55,366 rixdalers, or nearly 4*l.* 9*s.* per acre, leaving 1*l.* 13*s.* per acre to cover rent, interest of capital, and farmer's profit. Professor Wilson, in his Report upon the Aarhuus Exhibition, gives the gross receipts for this farm in 1865 as 58,750 rixdalers, which (supposing the acreage to have been the same) is equal to 4*l.* 14*s.* 6*d.* per acre, and the expenses as 38,636 rixdalers, which comes to 3*l.* 2*s.* 3*d.* per acre, thus leaving a gross profit of 1*l.* 12*s.* 3*d.* He observes, that the statement of the receipts and expenditure for 1865 "is less satisfactory than it would have been had the crops not suffered so severely from the continued drought of that season." Contrasting the receipts for the two years, it should be remarked that the increase in 1873 is probably due, in a great measure, to the unfavourable season of 1865; but it is also to some extent caused by the progressive fertility of the land, as shown by the quinquennial averages just quoted, and by the increased productiveness of the dairy, as exhibited in the decennial averages which precede them on p. 352, as well as by the recent increase in the price of butter. The increase in the expenses between 1865 and 1873 is no doubt chiefly due to the enhanced price of labour, especially that connected with the dairy; but increased expenditure on artificial feeding-stuffs has also had a considerable influence on this side of the account.

Meat Husbandry.—This description of agriculture is not pursued as the chief object of the Danish farmer, except in the northern and north-western districts of Jutland, and in the marsh-land districts on the west coast of that province and of the Duchies of Schleswig and Holstein. It will be more convenient here to sketch the North Jutland system, and to describe the marsh-land farming when treating of the Duchies. The North Jutland farmers generally crop their land as in other districts of the monarchy, the course being of nine years' duration, viz., (1) Bare Fallow; (2) Rye; (3) Barley: (4 and 5) Oats; (6, 7, 8, and 9) Seeds, usually mown the first year and fed afterwards. Cows are kept by the smaller farmers to as large an extent as possible; the heifer-calves are almost invariably killed as soon as they are dropped, and the bull-calves only kept on, getting milk until they are three months old, but not being allowed to suck the cows. The surplus milk is generally required for the household on these very small farms; and sometimes one or two bull-calves may be purchased when a preponderance of heifer-calves has been dropped. When developed into yearlings, the steers are sold to farmers who have more land than the small breeders; and at two years old they are again sold to still larger peasants. At three years old the bullocks are sold to large proprietors or tenant farmers, who occasionally fatten them in the stalls during the winter, but generally half do it, and pass them on in the spring to be summer grazed in the marshes, unless their own seeds are sufficiently good for them to attempt it themselves. A farmer holding 100 tönder-land (136 acres) would keep about 5 cows to supply the household with milk, and would winter from 36 to 40 three-year-old oxen which he had bought from the smaller farmers in the neighbourhood. Again, a peasant holding from 50 to 60 tönder-land (say 70 to

80 acres) would keep 4 or 5 cows for household purposes, and would winter about 20 two-year-olds. Descending in the scale another step, we come to the small peasant-farmers, who keep their one, two, or three cows, according to the extent of their holding, and who rear their bull-calves and sell them as yearlings to the class above them. Of late years, the most advanced proprietor-farmers have turned their attention more to the breeding of steers; but as a general rule they still depend almost entirely upon the system of stepping-stones just described.

Mr. Stradel's farm of Ullerup, in Mors, presents a typical example of the prevailing system under good management. It consists of a little more than 800 acres of land, of which three-fourths are under the plough, and one-fourth meadow. The course is (1) Fallow; (2) Rye; (3) one-third Barley, one-third Buckwheat, and one-third Vetches; (4 and 5) Oats; (6) Seeds mown; (7, 8, and 9) Seeds fed. The stock consists of 30 cows, 24 young cattle, and 110 oxen; also 60 ewes, 120 other sheep, and 16 horses. The oxen are bought in the autumn at about 3½ years old from smaller farmers at about 9*l.* or 10*l.* per head. The best of them are sold in the spring for exportation to England or Scotland, and the remainder go to be finished off in the Schleswig marshes. The prices obtained generally range from 17*l.* to 20*l.* per head. The whole of the oxen bought in the autumn are thus disposed of in the following spring, and others are bought to replace them in the succeeding autumn. The bull-calves dropped by the 30 cows are kept; but the heifers, except a few kept to replace cast-cows, are either killed soon after birth, or sold to peasants, who buy them because they are better bred than their own.

The cattle generally kept belong to the Jutland breed, of which there are said to be two distinct strains, one known as the "milking-race" and the other as the "meat-race." The latter, however, is the more important, the superiority of the Angeln breed as milkers having caused the displacement of Jutland cattle for dairy purposes. The following cut (Fig. 11) of a Jutland bull of the meat-race is from a photograph which has been kindly lent me by Mr. Tesdorpf.

M. Tisserand describes the Jutland cattle in the following terms:*—

> "The animals of this breed, which is much diffused throughout Jutland and a part of Schleswig, are intermediate between the Breton cattle of Ille-et-Vilaine, and the cattle typical of the Dutch breed, both in their contour and height. Their colour is black or red, with spots of white, and occasionally the ground colour is brown (*café-au-lait*); but they are never entirely black nor completely red. Their legs may be regarded as too coarse, but they do not fail either in breadth or brisket. They are much more adapted to the pro-

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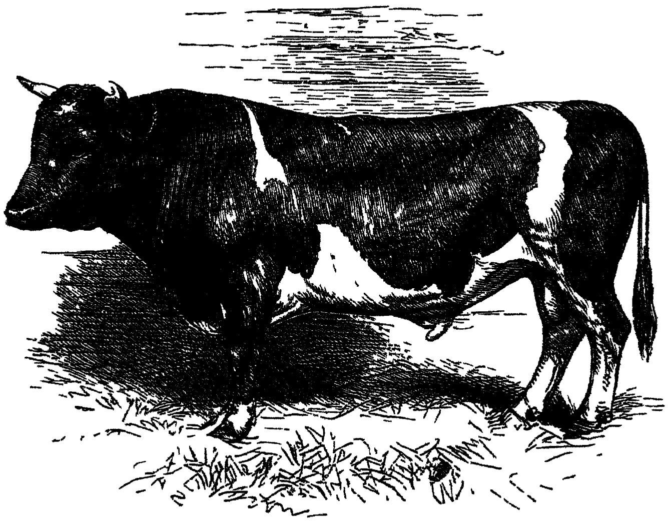
* *Op. cit.*, pp. 139 and 140.

Fig. 11.—*Old Bull of the Jutland Breed* (*Meat-race*).



duction of meat than of milk. The oxen are sought after by feeders, their meat is of a superior quality, with fine fibre and marbled flesh. They are not capable of early maturity, being rarely fit for the butcher before they are five years old. A good fat ox will yield on the average the following quantities of meat, tallow, and hide: 6 to 7 cwt. of meat; 1 to 1½ cwt. of tallow; and 45 to 90lbs. of hide.

"The Jutland cow is the representative of the Breton cow in Denmark. She makes the most of moderate grass, and gives milk when placed upon grass which would starve cows of a larger breed; but as soon as she is placed in good circumstances, such as rich pasture-land, she loses her superiority as a milch-cow, giving no more milk than upon poor land, but on the other hand takes on flesh. Her yield of milk does not exceed 320 to 340 gallons per annum. These cows, however, are preferred on many large farms on account of the richness of their milk, not only in Jutland but also in Schleswig; but the tendency is, nevertheless, to displace them by Angeln cows, which are much better milkers.

"A Jutland cow, when arrived at maturity, weighs on an average 8 cwt. Several thousand heifers are annually exported to the Grand Duchy of Mecklenburg. The pastures of Holstein and Schleswig also receive considerable numbers of Jutland steers to be fattened there. The oxen fattened in the marshes of the west coast, and of the Lymfjord, provision the towns of Elsinore, Copenhagen, &c.

"The best and largest of the Jutland cattle are found in the western part of Jutland near the Lymfjord (in the districts of Thy, Mors, Saling, Lemvig, &c.), and in the neighbourhood of Hadersleben in Schleswig. Here the small farmers devote themselves to breeding, and sell their young cattle at one or two years old. Every year, in changing owners, the steers are brought nearer to the alluviums of Schleswig and Holstein, where they are finished off. These cattle are never used as working oxen, horses alone being employed as draught animals in those districts."

M. Tisserand thus confirms in general terms my account of the peculiar system of rearing oxen which is adopted in Jutland on the ordinary farms of the country. The result of the system in producing fat beasts fit for our markets is well expressed in the following extract from a letter addressed to me by Messrs. Swan and Son, of Edinburgh, in 1874, just previous to my first visit to Denmark for the purpose of this Report.

"The Jutland breed of cattle we consider one of the best on the Continent; as cows they possess great capabilities in the production of butter. The bullocks, especially those stall-fed, show considerable excellence, but have this drawback—that they, like the Polled Angus, Aberdeen, and West Highland cattle of this country, are not easily fed up to the mark before they are five years old; while they have this defect—that they are deficient in beef in their best points, viz., along the sirloins, roasts, and rounds. These cattle even now command a ready sale; still, when weighed, they generally scale less than what they are called. We have for many years, in our Annual Report of the Cattle-trade to the Danish Consul-General, urged the necessity of Shorthorn-bulls being introduced into Jutland, and we have this year (1874) sent a large lot of such into that country. At first there was a prejudice against crossing, but now that is being gradually, but we think surely, overcome. For example, at the recent Jutland Cattle Show (May 26th) there was a display of first- and second-cross Shorthorns, many of which would have occupied a high place in any fat Show in this country. The *premier* prize was given to a wonderfully good ox, first-cross between Jutland and Shorthorn bull; while two bullocks, one a first- and one a second-cross, were sold at 65*l.* each. This was, perhaps, 20*l.* more than the commercial value; but the buyer is now exhibiting them in Copenhagen. We have frequently sold large lots of native-bred Jutland bullocks to farmers here, and these in all cases have paid well; but there can be no doubt whatever, that were a general system of crossing adopted in Sweden and Jutland, in these countries proverbially the healthiest in Europe, where the whole prosperity of the people is centred in agriculture, and where the isolation of them from other countries is so complete, Great Britain could derive a large and increasing supply not only of prime fat, but likewise a lot of really good and useful store-cattle."

The supply of meat to Great Britain from extraneous sources need not, indeed, be confined to fat cattle, provided that sufficient precautions are taken at the ports of shipment, as well as the ports of landing, against the conveyance of disease. With proper regulations, thoroughly carried out, there ought to be even less risk of importing disease from certain countries of Northern Europe, which are generally free from contagious or infectious cattle-diseases, than from Ireland. The United Kingdom may be said to be never quite free from foot-and-mouth disease and pleuro-pneumonia, especially as the cross-Channel cattle-trade is practically uncontrolled in reference to the conveyance of infected beasts, although efforts which have lately been made to prevent the conveyance of obviously diseased animals have been attended with a certain amount of success.

On this question Messrs. Swan and Sons write as follows:—

> "There is generally amongst the farmers and proprietors of this country an outcry against free admission of foreign cattle, many of whom insist that all such should be indiscriminately slaughtered at the ports. The fact, however, is, that if they limit their outcry to countries from whence disease is likely to be imported, and give countries which impose restrictions similar to those in operation here (as in the case of Germany) free admission for their stock, an inducement will be held out to provide cattle adapted for this country; those not adapted for slaughter will be available for stores. It is, in our opinion, the lessening of *cattle-breeding*, and the increase in the consumption, which restricts the farmers' profits. Lean cattle, as a rule, are much dearer, comparatively, than fat cattle. The progress of agriculture every year is causing land, hitherto only known as available for rearing cattle for sale as stores, to be farmed for grain and the production of meat; while the great extent of land in the North of Scotland, especially, previously productive of West Highland cattle and sheep, now laid into deer-forests, coupled with high wages and increased consumption of meat, is a sufficient inducement for every encouragement being given to the foreigner who can provide us either with beef, mutton, or the material for farmers in this country to produce such.

Ten years ago Professor Wilson wrote on this subject, in his Report on the Aarhuus Exhibition, as follows:—

> "Some few months ago it was remarked in a leading article in one of our Agricultural Journals,* that 'there can be no doubt that the present restrictions on the foreign cattle, whatever useful purposes they may serve, are doing English agriculture a great deal of harm. Live-stock, which is what our farmers want to buy, is at an outrageously high price, and the enormous imports of fat meat from abroad are completely revolutionising the trade in fat beasts, which is what they have to sell. The value of that which the farmers have to sell is thus artificially depreciated, while the price of that which they want to buy is artificially exaggerated. If the store-stock of other countries were available for our farmers as their fat stock is for our butchers, we should retain a fair proportion of that artificial premium which the Orders in Council are now putting into the pockets of foreign feeders. As the matter now stands, the English feeder is placed at a very great disadvantage.' And again, quite recently, the subject has been mooted, and the same want thus expressed: 'The great difficulty lies in the question of store-stock; how and where are we to obtain the proper supply of beasts, and under what restrictions?'
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> "If we turn to page 51,† we see that the surplus animal produce of Denmark comprises amongst other stock nearly 40,000 beasts, and between 500 and 1000 calves. Although this country has long been the market for Danish farm-produce, the present restrictions on the import of live-stock, which draw no line between infected and non-infected countries, limit the trade between the two countries to fat stock, and thus force the export trade in store-cattle into other channels.
>
> "The condition of Danish farming is not at present equal to the feeding of all the surplus cattle-produce of the country. Last year 5300 fat beasts, and 60 calves, were all that we received; the rest were sold in a store-condition to

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* 'Agricultural Gazette' for October 4, 1866.

† Of Professor Wilson's Report.

Hamburg, Holstein, &c., where they were fed, and thence found their way, fattened, in all probability, upon Danish oil-cake, to our markets—an intermediate agent thus reaping the profits that ought to have been shared by the producer and consumer. This disturbance to the trade between our two countries tells heavily just now on the interests of both: the present are of most importance, perhaps, to Denmark; the future to us. I was informed, on reliable authority, that Denmark could export at once at the rate of 40,000 store-beasts per annum, with a probable increase, if the trade answered, of 10,000 each year; and with these could be sent the surplus-stock of upwards of 3000 tons per annum of oil-cake. The interest of the Danish farmers clearly is to consume their cake at home, and send us over fat- instead of store-stock; ours is to take their store-cattle and their cake, and from the two manufacture our own butcher's meat, finding our principal profit-returns in the beneficial consumption of our roots, and the value of the resulting manure.

"The risk of infection from Denmark is reduced to a minimum. The geographical position of the country isolates her well-nigh as perfectly as our own, while, at the same time, her surplus-produce going outwards diminishes the chance of any imported disease. The existing regulations, too, of the Government are of the most searching and stringent character. It is understood that any additional restrictions will be placed, in regard to both import and export movements of stock, that may be considered desirable to ensure perfect safety to the cattle-trade between our two countries. Can no measures be devised to meet this unsatisfactory state of things? Can no regulations be framed that will allow us to buy, and Denmark to sell, what we mutually want, and thus benefit both countries without increasing the risk to either?"

Since the foregoing extract was written, great changes have been made in our laws relating to the importation of foreign cattle. Two years afterwards, the Contagious Diseases (Animals) Act, 1869, was passed, and under it, and the Orders in Council issued under its authority, foreign countries from which we import cattle have been divided into two classes, viz., the *Scheduled* and the *Unscheduled*. Animals from *Scheduled* countries are not permitted to go into the interior of the United Kingdom, but must be slaughtered in a certain *defined part* of the port of landing; while those from the *Unscheduled* may pass into the country if the Government Veterinary Inspector certifies them to be free from disease, as a result of his examination of them by daylight, after they have been landed for a period of not less than twelve hours. Denmark is included in the list of *Unscheduled* countries, and there is now, therefore, no legislative impediment to the importation of store-stock from that country. We have seen from the Table on p. 319, that the importation of cattle from Denmark into the United Kingdom has more than trebled in the five years, 1870–74, succeeding the passing of this Act; but there can be no doubt that this increase almost entirely consists of fat cattle, the system of agriculture hitherto pursued in Denmark, as already described, resulting in the large proprietors or the marsh-land farmers getting the profit of the meat-manufacture.

The Danish Government has recently had this question under consideration, and has made a special enactment to the following effect:—

"1. Every animal intended for export to Great Britain must, at the shipper's expense, be examined by a veterinary surgeon authorised by the police. No animal will be allowed to be shipped if it shows symptoms of any infectious disease, or if suspicion exists of its being affected by such illness. A certificate to this effect must be given by the veterinary surgeon.

"2. During the veterinary examination the different droves are to be kept separate, so that no possibility of infection from one drove to the other can arise.

"3. No animal intended for export to Great Britain by ship will be allowed to be shipped without authorisation of the police. If there are grounds for supposing the vessel to be infected, then this permission will not be granted until the vessel has been properly disinfected.

"4. Every animal, previous to shipment, shall be distinctly marked by means of oil-colour or burning on the horns. These marks are to be entered in the bill of health issued by the veterinary surgeon, together with a statement of sex. The shipment is to take place under the supervision of the veterinary police."

It must be admitted that these regulations give ample authority to the veterinary inspectors and the police, as they may detain not only *infected* animals, but also *suspected* ones; and even a vessel may be detained if there are *grounds for supposing* that it is infected. Such latitude is not allowed to the officers of the Veterinary Department in this country, as there must be absolute proof of infection before the regulations of the Act and Orders in Council can be enforced. That the Danish Government has put so much discretionary power in the hands of its officers, and that Danish farmers and dealers not only submit to the regulations, but approve of them, must be regarded as a clear proof of the importance which is attached by the most interested parties to the free importation of cattle from Denmark into Great Britain. The Danish cattle-trade is so intimately bound up with that of Schleswig-Holstein, that similar regulations are in force in the Duchies to those recently enacted in Denmark. On this side, the Privy Council have endorsed the clean bill of health which the kingdom and Duchies have hitherto enjoyed; and the regulations under which the cattle-trade is carried on there have been supplemented here by an exemption from the application of the Fourth Schedule of the Act, which applies to the remainder of the German Empire, provided that the owners or charterers of the vessel in which the cattle are carried certify that they have been bred and fed exclusively in Denmark, Schleswig, and Holstein, or some one of them, and have never been in contact with cattle not so exclusively bred and fed, and have not within the last three months been carried at sea on any vessel.

Cattle from Hamburg come under the regulations of the Fourth Schedule; but those from Tönning, Husum, Copenhagen, the new port of Esbjerg, &c., may be exempted by such a declaration duly certified by the Consul of the port.

An increase in the importation of Danish store-cattle cannot, however, be looked for until English dealers have taken the initiative in their importation; and they have hitherto, apparently, been deterred by the reluctance of farmers to purchase any foreign cattle for store purposes, no matter what their nationality, although the consignments of fat stock direct from the Danish farmer have recently very much increased. The prices mentioned in the course of this Report show that store-stock could be obtained at reasonable rates; and the testimony of Messrs. Swan and Sons as to the value to the butcher of crossed Shorthorn and Jutland oxen seems to show that the fattening of such beasts would leave a good margin of profit in the hands of the feeder. There can also be little doubt that the creation of a demand for store-cattle in Denmark would soon lead to a marked diminution of the general slaughter of newly born calves, a practice which strikes an Englishman as being alike wasteful and unnecessary.

Much of the success of such a movement as I have indicated would depend upon the extent to which Shorthorn-bulls are used in Denmark. On this point it may be said that in the Marshes it is almost impossible to find a bullock that can be certified as a pure-bred animal, and the cross is almost invariably the Shorthorn, although not always of ancient lineage. In Jutland, Shorthorn-crosses are not so general, but still they are often met with, and good Shorthorn-bulls are kept not only by large proprietors, but sometimes by veritable "Bönder," or peasant-farmers.

As an instance of the latter kind, through being the more unusual, I will mention Mr. Trohldahl, of Graa Molle, near Aarhuus, whose farm is only 136 acres in extent. He keeps three Shorthorn-bulls and twelve cows, and he charges 10*s.* as a covering fee to his neighbours. He has been getting as much as 10*l.* or 11*l.* for his calves when three weeks old, and he finds that the Shorthorn-Jutland cross-breds are as large at two years old as the pure native beasts are at four. Nevertheless, he feeds a number of the latter every year, because they pay. He buys them when from four to five years old at 10*l.* to 12*l.* per head, and sells them, fat, in about six months at from 22*l.* to 24*l.* each. He feeds 15 beasts in the summer on seeds, and 17 in winter on corn and cake, commencing with from 1 to 1½ lb. of cake, and gradually increasing the quantity to 4 or 5 lbs.

Before concluding this somewhat imperfect sketch of the meat-husbandry of Denmark Proper, I will give a short outline of a farm on which sheep are bred and fed for the English market; not only because it is of interest as showing what may be done with sheep in a country where, as is general on the Continent, it is not a popular animal of the farm, except with the labourer, but also as an example of land which has recently been brought into cultivation.

The farm of Rosvang, belonging to Mr. Inspector Buus, situated near Thisted, in North Jutland, comprises rather more than 1700 acres, of which not more than 1360 have yet been brought into cultivation. The land was formerly covered by a lake, but nine or ten years ago the water was drained off by means of a canal. Immediately after the reclamation, the land was laid down to grass without a crop; and about 800 acres of the most productive portion still remain in pasture, generally of a rough character, on a peaty and more or less water-logged soil. Two rotations of cropping are adopted on the remaining land, which was broken up, as it did not answer in grass. On the poorer marly land the shift is one of five years, namely: (1) Turnips and some carrots, or peas, sometimes beans, where the land is strong enough; (2) Oats sown out with clover and rye-grass; (3 and 4) Grass; (5) Barley. This land requires to be well manured, and farmyard-dung is therefore applied for the three tillage-crops. The other rotation is of four years, the succession being: (1) Turnips, (2) Oats, (3) Barley, and (4) Wheat, which is remarkable as inverting the order in which the cereals are generally taken in Continental countries. The land in this case contains a large amount of decayed organic matter, and the manure given for the turnips consists of 3 cwt. of superphosphate per acre, in addition to dung; the oats are not manured, but farmyard-manure is applied to the land for barley, and 3 cwt. of superphosphate per acre to the wheat course.

Three hundred head of cattle are kept, chiefly of the Angeln. breed. They comprise 180 cows, of which one-fifth go out every year; and at the time of my visit there were also 36 old cows being fattened, 12 two-year-old heifers (the latest dropped of their year), 36 yearlings, and 36 calves. The young cattle go out in April, and the cows in the middle of May, remaining on the grass until November, and the calves are generally dropped about the following month. The winter allowance for each cow is 25 cwt. of hay and 11 to 12 cwt. of corn, with about 40 bushels of turnips, mixed with some carrots. Mr. Buus would prefer mangolds, as turnips do not improve the butter, but in his climate he has found it impossible to grow mangolds to advantage. The cast-cows get a larger quantity of turnips, and a daily allowance of from 3 to 4 lbs. of linseed-cake, 3 lbs. of pea-meal, and 4 to 5 lbs. of tail-corn (oats and barley). The heifer-calves not wanted to replace the old cows are killed soon after birth, and all the bull-calves share the same fate, all the milk possible being devoted to the manufacture of butter and skim-cheese.

The flock consists of 500 ewes, a cross of Cotswold rams on Danish ewes. About the 21st of September they run with the ram, as many as a hundred ewes being allotted to each ram. Two-shear ewes and upwards will drop three lambs for every two ewes; and Mr. Buus finds that the lambs do very well until they are weaned, in August, after which their progress is less satisfactory. He has tried giving them cake on the grass after weaning, but has not yet made the experiment of getting them accustomed to artificial food while still with their dams. Latterly he has sent some of his best lambs to Edinburgh, and in 1873 obtained about 32*s.* per head for them. About 100 gimmers go into the flock every year. The sheep are sent into well-constructed and lofty sheep-stables, constructed to hold 100 each, about the 1st of December, and remain in them until the beginning of April, getting as many turnips as they can eat, with the exception of the ewes, which are limited to a daily allowance of 7 lbs. per head, with ½ lb. of linseed-cake or soaked peas. The wethers are sold at 18 months old, scaling about 150 lbs. each, live-weight.

On the poor land, cropped under a five-course shift, a good crop of barley is 28 bushels per acre, but on the better land it sometimes reaches 50 bushels; oats on the poor land yield about 33 bushels per acre, and 50 to 55 on the better soil. Wheat is only taken on the better land, and a good crop is about 4 quarters, or a little more, while 40 bushels of peas is not an unusual return. The total sales off this farm average about 50,000 rix-dollars, or about 4 guineas per acre on the cultivated area of 1360 acres.

It will now be convenient to give a sketch of the farming of Schleswig and Holstein, and afterwards to describe shortly the condition of the labourer, both in the kingdom and the Duchies.

SCHLESWIG AND HOLSTEIN.

The Duchies are divided, naturally, into two agricultural districts, namely, the Upland, or *Geest*, and the Lowland, or Marshes. The *Geest* is a southern continuation of the dairy district of Denmark, and forms the whole of the territory of Schleswig and Holstein with the exception of the broader or narrower fringe of fertile marsh-land, which borders the Elbe and the German Ocean on the western side of the Cimbrian peninsula. Proceeding from west to east, say from Altona to

Kiel, the map shows that the marsh-land is succeeded by a tract of poor sandy land, mostly in heath; but towards the vicinity of Neuminster the country becomes undulated and the land of better quality, studded with oaks and beeches, the fields being enclosed by hedges of hazel and beech, often in a state of luxuriant growth. In fact, the aspect of the country strongly resembles that of some parts of England. Thus, the geological constitution of the Duchies presents a close parallel to that of the southern part of Jutland; the differences, which are merely of degree, being that the belt of marsh-land has expanded, and the strip of sandy heath has diminished in breadth.

The Geest.—The farming of the *Geest* is very similar in principle to that of the dairy region of Denmark; but generally it is not so good, and the dairying, in particular, is by no means so skilfully carried out. Twenty years ago a different verdict would have been given; and, in fact, has been given even more recently by Mr. Rainals and other writers; but, in the meantime, the dairying of Denmark has made remarkable progress, while that of Schleswig-Holstein has remained stationary.

The Duchies are the original home of that once-famous system of cropping which has been entitled *Koppelwirthschaft.* This was doubtless a great stride in advance of the three-field shift (bare fallow, wheat, and barley), which until then had prevailed all over Europe. I have already shown how this Koppelwirthschaft extended through Denmark to Sweden and Norway, and how it has been improved in the more northern countries. Therefore, it will be sufficient here to add that in its original home the most simple rotation is: (1) Bare Fallow, (2) Rye or Wheat, (3) Barley, (4) Oats, (5) Seeds mown, (6 and 7) Seeds pastured; but on strong land a crop of rape-seed is taken before the rye or wheat, and on lighter soils a second crop of oats is taken before the land is sown out; and it not unfrequently happens that both these additions to the rotation are made, either with or without a corresponding extension of the period during which the land remains in pasture. On ordinary farms the bare fallow is manured, and no other course in the rotation; but there are many large proprietors who follow a more enlightened system.

A special feature of the fallow-break is that it gives an opportunity to cut down the surrounding hedges for firewood; but this must be done so as not to cause injury to a neighbour, or to expose him to the probability of injury. The farmer would also take care of his own interests, and would not, for instance, cut down a fence between fallow land and a seed-break which was being pastured.

There is a general belief in the Duchies that grass will not grow permanently out of flood's way. This is probably an outcome of the fact that the marshes, which produce such wonderful pasture, are below the water-level. It is also true that the land bordering streams cannot grow corn, as it is waterlogged; but drainage, like turnip-husbandry and alternate cropping, has still to be introduced to the bulk of the farmers of Schleswig and Holstein. Anyhow, it is exceedingly curious to see the margins of streams and the very bottoms of valleys clothed with grass for a few yards or so at the sides of each brook or rivulet, the steeper the bank the narrower the fringe, and *vice versâ.* These strips of grass with meandering boundaries are immediately succeeded by arable land without any intervening fence.

That grass will grow at higher levels, in Holstein as elsewhere, has been proved by Mr. Berndes, of Lammershagen, who farms 1600 acres, 200 of which he has laid down in permanent pasture. This seeded land is in two pieces, of the ordinary undulatory character of the country; one piece, when I saw it in 1874, had been down four years, and had been liberally treated with liquid manure; it seemed a marked success, and the other piece bid fair to be equally good if encouraged by putting cake-eating fattening animals upon it.

The ordinary farms of the country are about 100 acres in extent, and the rent averages about 10*s.* per acre. The farmers keep as many cattle as they estimate that their spring-corn will feed during the winter (after making due allowance for the oats required for the horses). Thus, only the wheat, the dairy products, and the cast-cows are sold off the farm, as the calves not reared are generally consumed by the labourers and the farmer's family. Sheep are not kept on ordinary farms, but there are shepherds who keep a breeding flock of the native sheep. Little or no land is either possessed or rented by them; but they make arrangements with farmers for the sheep to run over the bare fallow and stubbles. I was unable to ascertain anything like an average price for this grazing, as the whole thing is a matter of bargain as to money-payment, number of sheep, length of time, &c.; but there can be no doubt about one thing, that the more foul the land is, the more money for its use will the farmer obtain.

Mr. Berndes keeps 350 ewes. They were originally of the native breed; but for some few years have been crossed with Shropshire rams, chiefly from the flocks of Lord Chesham, Mr. Mansel, and Mr. J. Evans, of Uffington. From the last-named breeder Mr. Berndes has also obtained fifteen ewes, so as to enable him to breed a few rams. To improve his flock as rapidly as possible, he has been putting into it all the best ewe lambs, and selling out the inferior ewes having a smaller proportion of Shropshire blood. When he gets enough land laid down to grass, and can organise his labour so as to admit of extended turnip-cultivation, he will increase his flock of ewes; but at present he is almost alone in that part of Holstein in growing any turnips, and in trying to get permanent grass above the water-level.

Mr. R. M. Sloman, the owner of Lammershagen, is trying to induce his smaller tenants to grow turnips by inserting in their leases a clause compelling them to grow at least 5 English acres per annum; and another stipulating that as each portion of the land comes into bare fallow it shall be drained, he finding the tiles and the tenant the labour. Mr. Sloman, however, is very far in advance of his neighbours; a result which I patriotically attribute to some extent to his frequent visits to England, aided by his fluent use of the English language.

Mr. Berndes keeps 200 cows on his farm of 1600 acres. They are chiefly of the Angeln breed, but he uses an Alderney bull. They are out on old seeds, or permanent grass, from the 1st of May until the end of November; and in the winter are fed in the stables with hay, corn, and sometimes a little linseed-cake. As in Denmark, so in the Duchies, the larger farmers do not, as a rule, devote enough attention to breeding, but depend almost exclusively upon the smaller farmers for a supply of heifers to renew their herd. Of late years the increased cost of heifers has forced their attention to this matter, and the result is that some large farmers, like Mr. Berndes, are now careful in the selection of their bulls.

A departure from Koppelwirthschaft principles may be seen on the farm of Mr. Petersen of Wittkael, near Schleswig, whose course of cropping is: (1) Wheat, (2) Mangolds, (3) Barley, (4) Clover, (5) Oats, (6) Beans. The farm consists of 140 acres of arable land and 30 of pasture. Eight horses, 30 cows, and 70 ewes are kept. The cows drop their first calf when 2½ years old; about 5 heifer-calves are kept, and the remainder share the usual fate of calves in these regions. During the summer the cows are soiled, commencing generally in the middle of May, with some hay added to the cut grass, but later they get nothing but the grass, cut and brought to the stables, until the middle of October. The diet is then changed to mangold leaves, with a little corn, but chiefly cake, viz., ½ lb. linseed and 1 lb. palm-cake per cow per diem. The sheep are a cross of Cotswold and Danish; they clip an average of 4 lbs. of wool in the spring, and again 3½ lbs. in the autumn before they go into the sheep-stables for the winter. About 30 ewes go out of the flock every year, and generally about 90 sheep are wintered. Between 5 and 6 acres of lucerne are grown; the crop is cut three times in the year: the first cut is made into hay, and the rest is given green to the cows in the stalls. About 5 acres of turnips are grown for the sheep and cast-cows. Mr. Petersen expresses himself thoroughly satisfied with the results of his system as compared with those obtained by his neighbours who adopt the Koppelwirthschaft farming; while the latter look upon their neighbour as a theorist and an experimenter, but not as a practical farmer. This opinion is strengthened by the fact that Mr. Petersen has invented a peculiar system of pipe-draining, the essential features of which are that the pipes follow the contour-lines of the surface of the land, and are furnished with shuttles and other contrivances to enable the drainage water of the higher land to be used, when required, for the subsoil irrigation of the lower.

The Marshes.—The name of this district suggests to an Englishman a tract of rich pastures with little or no land under the plough; but this would not be an accurate description of all the marshes of Denmark and the Duchies, for the proportion of grass to ploughed land still varies very much, notwithstanding that the tendency to convert tillage into pasture has recently been stimulated throughout the marsh country by the high price of meat and the increasing cost of labour. There are several distinct marshes, more or less separated by inlets of the sea, or by the mouths of rivers which discharge into the Elbe. They are generally known by the name of the principal town situated within their confines, and thus we have the Tondern Marsh, the Wilster Marsh, the Krempe Marsh, &c.; while the Eiderstädt and other Marshes take their name from the river or inlet of the sea which separates them from adjoining drainage districts.

All, or nearly all, the marshes are at a lower level than the sea and the rivers, which form two-thirds or more of their boundaries, and from which they are protected by dykes and ditches, as in the Low Countries proper. Indeed, history shows that so long ago as the 12th century these marshes were first colonised by Dutchmen, who were driven from their own country by disastrous floods of great magnitude. In opposition to our proverb that "A burnt child dreads the fire," they emigrated to a district of the same character as that from which they had been flooded out, and carried with them their agricultural practices and their engineering skill. To this day, the language and dress of the people, as well as their homesteads, show their Dutch origin; and, until recently, the system on which rents were calculated, known as "Holländerei," told the same tale. In this Report it is impossible to go further into these matters, which, especially the dykes and the drainage, can be much better studied in Holland—their original home.

The general system of agriculture pursued in these districts depends upon the relative quantity of permanent pasture. Thus, in the Krempe Marsh, where there is little grass, but heavy corn land, comparatively few cows are kept; but oxen are bought at about 3½ years old from the Geest districts, stall-fed during the winter with corn and clover hay, and passed on to be finished off during the next summer on the rich grass-land of other marshes. In some of the lighter-land districts, such as parts of the Tondern Marsh, where there is a proportion of grass, but not of feeding quality, cows are kept and the calves reared, and sold at 2 or 3 years old, either in summer to go to the feeding pastures, or later in the year to be wintered as just mentioned. The smallest farmers in these districts frequently have not enough fodder or straw to enable them to winter their calves, in which case they are sold to larger farmers who do not breed so many as they can keep through the winter. Thus we see a repetition of the system already described as characteristic of the meat-husbandry of Western Jutland. Still another, and perhaps the most important, type of marsh is that which consists entirely, or nearly so, of permanent pasture of feeding quality. To these districts the cattle exported to England, whether direct from Tönning and Husum, or by way of Hamburg, are sent to be finished off, and they are in consequence the great factory of fat beef in the Cimbrian peninsula.

The course of cropping pursued on arable land varies considerably with its strength, and with the proportion of permanent pasture on the farm; but the following may be taken as an average rotation on good corn land:—(1) Oats after seeds; (2) Beans; (3) Bare Fallow; (4) Rape-seed; (5) Wheat; (6 and 7) Seeds. If rape-seed is not grown, the necessity for a bare fallow is removed; the beans would then be succeeded by oats, which would be followed by wheat. Sometimes two crops of oats in succession are taken after seeds and before beans, and on some farms the seeds are left down more than two years, especially where there is a scarcity of permanent grass. Mr. Schmidt-Tychsen, of Bohrendorf, near Detzbüll, in the Tondern Marsh, informed me that in his neighbourhood the ordinary course on ploughed land was (1) Bare Fallow; (2) Rape-seed; (3) Wheat; (4) Oats or Beans; (5) Barley; (6) Beans; (7) Oats (when the land is good), returning again to fallow without any clover or other seed-course. The fallow-break is manured, but no other course in the rotation, unless it is the barley-shift, and that only occasionally. No artificial manure is used.

Mr. Schmidt-Tychsen is the owner of over 300 acres in the Tondern Marsh, but he lets about 100 acres of by no means the best land at a rent of 57*s.* per acre for the summer months, reserving to himself the winter grazing for sheep. On the other hand, he sometimes rents additional land as he requires it, and for the best summer grazing pays over 70*s.* per acre, viz., from April 1st to November 10th. Most of the land in his district is in grass, and on his own property he gradually reduced the area under the plough until he had laid it all down. Mixed farms are let at about 50*s.* per acre, but good grass farms fetch 70*s.*, or even more. Cattle are not often put on the pastures until the 1st of May, and then, in his district, 1 bullock is allotted to 1¼ acre; but if there is a good crop of grass a few sheep are added to the number of cattle, the general proportion being 20 oxen and 10 sheep to 25 acres. He gets from 4*l.* 10*s.* to 7*l.* 10*s.* increase in the price of the bullocks in return for their keep for from four to six months. Shorthorn crosses with marsh cattle are bought in the spring at an average price of about 18*l.* per head when 4 years old. Few Danish cattle find their way into his district except cast Angeln cows, which can be bought at about 7*l.* 10*s.* in the spring, and sold in the autumn at about 12*l.* per head. Sheep, generally of the Cotswold, Lincoln, or Leicester breeds, more or less crossed, are bought in the autumn at about 36*s.* per head, and in the spring they are estimated to be worth 48*s.*, lean. They are not, however, sold until after they have been clipped, at the end of April or beginning of May, the fleeces weighing about 7 lbs. each. The price obtained for the wool varies from 1*s.* 6*d.* to 2*s.* 3*d.* per lb. There is no strict method in the farming of the district, but cattle and sheep are bought and sold as seems desirable, and sheep are sometimes bred. Sheep are kept on the land during the whole winter, but no oxen are kept during that season, except on farms which consist partly of ploughed land, where they are wintered on straw, rape-cake, tail-corn, beans, and bean-haulm.

Further south, in the Tönning Marshes, whence come the famous Tönning cattle to the London market, agricultural practices differ little from those just sketched; but as Mr. Hems, of St. Annen, near Friedrichstadt, not far from Tönning, was able to give me some more precise information as to his own results, it may be useful to give a brief account of his farm. He occupies nearly 500 acres of land, of which only about 80 are under the plough, the remainder being permanent grass that will carry 20 bullocks to each 25 acres. They generally go off at 3½ years old from the grass, weighing from 80 to 100 stone dead weight, but a few are kept on until they are 6 years old, when some will scale dead as much as 180 to 200 stone. They are bought at 3 years old, at about 20*l.* per head, and generally sold six months afterwards, fat off the grass, at from 25*l.* to 28*l.*

each, being sent direct to England, consigned to agents. The system of breeding and rearing pursued in other districts is also in vogue here, the average price which a small farmer gets for his stock at 18 months old being 9*l.* for heifers as well as steers. At 3 years old they fetch double that money, or rather more in the case of good ones, the usual breed being the native race crossed with Shorthorn blood. In Mr. Hems' district the rent of very good pasture is not far from 5*l.* per imperial acre from April 1st until the middle of November: but the winter grazing with sheep is not worth more than 5*s.* per acre. Between 40 and 50 acres of land are mown every year, and with the aid of this hay Mr. Hems is enabled to winter about 130 oxen, which are finished off on the grass next summer. He also buys about 120 more in the spring to be summer grazed on his own land; but if he is able to rent more grazing, he buys more cattle in proportion. In addition to cattle, he keeps 60 ewes of the Wiedinghade breed crossed with Cotswold; they clip about 7 to 8 lbs., and from 60 to 80 shearlings are annually sold fat, weighing from 20 to 24 lbs. per quarter. Mr. Hems finds that grass-land in his district pays much better than corn growing, so he also, like Mr. Schmidt-Tychsen, has gradually increased his acreage of pasture. The new grass has been laid down by sowing the following mixture of seeds with spring wheat or barley, or preferably without a crop, the quantities being in lbs. per acre:—

8⅓	lbs.	*Lolium perenne.*	1⅔	lbs.	*Phleum pratense.*
16⅔	„	*Festuca pratensis.*	16⅔	„	*Poa pratensis.*
3⅓	„	*Festuca avena.*	16⅔	„	*Poa trivialis.*
16⅔	„	*Alopecurus pratensis*	25	„	*Agrostis vulgaris.*
16⅔	„	*Cynosurus cristatis.*	1⅔	„	*Trifolium medium.*
1⅔	„	*Dactylis glomerata.*	8⅓	„	*Trifolium repens.*

The young seeds are grazed for the first time during the summer following that in which the corn was harvested, and will even then fatten a large number of oxen. After this grazing, farmyard-manure is applied, and a year or two afterwards a dressing of marl and dung is given. I saw land that had been grazed only one year, and another piece that had been down six years; both looked very good; and the latter, although it had been stocked all the summer with oxen at the usual rate, had still plenty of keep on it. The arable land is cropped on the following four-course shift: (1) Oats and Vetches, turnips, clover, and peas; (2) Wheat; (3) Beans; (4) Oats. Six working horses and ten labourers are required on the whole of the farm. The men are paid by the day, but are kept all the year round, though they earn more in summer than in winter, the average for the year being about 12*s.* 6*d.* per week.

As an example of a well-managed farm consisting principally of arable land, I may quote that held by Mr. Johann Kahlke, near Heide, in the Ditmarsh. It measures about 380 acres, two-thirds of which are under the plough. The rotation on the stronger half of the ploughed land is, (1) Beans; (2) Wheat; (3) Sugar-beet; (4) Spring Corn (either oats, barley, or spring wheat); (5 and 6) Seeds, which are sometimes left a third year. On the lighter land the course is, (1) Oats; (2) Wheat; (3) Spring Corn; (4, 5, and 6) Grass, which has a bastard fallow previous to the oats being again sown. Wheat is sown broadcast about the end of September or beginning of October to the amount of 12 to 14 pecks per acre; but if it is drilled, 20 per cent. less seed is required. Barley is sown comparatively thin, not more than about 10 pecks per acre being used; the period of barley sowing extends from March until May, the latter month being preferred by Mr. Kahlke, as late sowing gives him a better opportunity to clean his land. Oats are sown in April, and about 5 bushels of seed per acre is usual. Beans are drilled as early as possible in February or March at a distance of 1 foot apart, the quantity of seed used being from 5 to 6 bushels per acre. The yield is reckoned in multiples of the seed, a good crop of wheat being 12 times, oats 17 or 18, barley 20 to 25, and beans 8 to 12 times. One-third of the available manure is put on the land after the sugar-beet crop, and the remainder is applied (on the land where sugar-beet is not taken) to the seeds in the spring, before they are broken up for beans or oats; in this way more clover, and consequently more corn, is said to be obtained. The mixture sown is 10 lbs. of red clover per acre and 2 lbs. of white, and no grasses; but both grasses and white clover grow naturally. Little or no artificial manure is used, as the seed-course is believed to be the best dressing the land can have, and Mr. Kahlke's great object is to have as much land in clover as possible, provided he can keep it good enough. Much of his clover-break will fatten small beasts without artificial food. For sugar-beet, the wheat stubble is ploughed in autumn, and cultivated to the depth of 10 or 12 inches in spring, afterwards being deeply ploughed with four horses, and then harrowed and rolled. The seed is dibbled in rows 18 inches apart, and harrowed in; and when the plants appear they are hoed and left in bunches 8 inches apart, being afterwards singled and the earth drawn away from the one plant left. They are again hoed twice, either by hand or machine, preferably by hand, generally in June or July, but all operations must be finished by the end of July. As a rule, the roots have not been covered with earth at any period, but in 1874 they were thus treated for the first time. The land in sugar-beet is let to a manufacturer under two different contracts. On two-thirds, the manufacturer does all the work and pays the farmer about 6*l.* 10*s.* per acre, besides returning him 18 per cent. of the weight of roots in pulp without payment; the manufacturer also conveys the roots to the factory and gives the leaves to the farmer, who lets them remain on the land as a manure. On the remaining third of the beetroot-course, the farmer does all the work, and is paid for the roots which he delivers at the factory at the rate of 18*s.* per ton before the 1st of December, and 20*s.* per ton after that date. He also has the right to buy back 18 per cent of pressed pulp at from 12*s.* to 14*s.* per ton, or 30 per cent. of diffusion pulp at 6*s.* per ton.

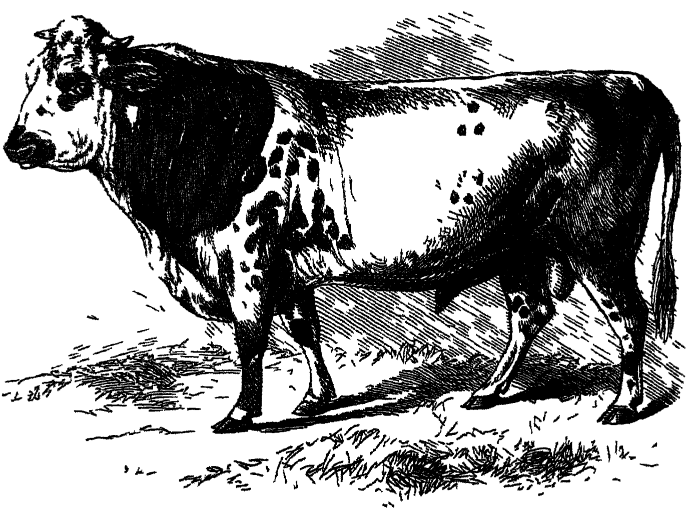
Hand-labour for the beetroot-course costs 3*l.* per acre, and an additional payment of 2*s.* per ton when the crop exceeds 16 tons per acre. An average crop is said to be 14 to 15 tons per acre. All the labourers are paid in hard cash and by the piece, except the unmarried men, who live on the farm. The younger men, or lads, get about 12*l.* per annum and their food, while more experienced men get proportionally higher pay. An average labourer working by the piece will earn about 45*l.* per annum; most of these men own their cottages and more or less land, sometimes only a small garden, but generally enough to keep a cow, or say from half an acre to 4 acres.

In the neighbourhood of Heide there is not so much permanent grass as in the Friedrichstadt district, therefore more cattle are bred and not so many fattened; but Mr. Kahlke does not keep more than 8 cows, of the Marsh race crossed with Shorthorn, and the calves of these he rears. A small proportion of the clover is made into hay and the rest grazed with young cattle. He aims to keep two dozen calves and the same number of yearlings and two-year-olds, some being of his own breeding, and the remainder purchased from farmers who have no permanent pasture. Each year 24 of these are fattened off on the permanent grass and are included in the 70 fat cattle which will be mentioned presently. He buys between 40 and 50 2½-year-old oxen in September and October, and gives them straw and beetroot pulp, or roots, with bean-shuds, oat-cavings, and sometimes a little cake, during the winter. About the beginning of May they, with about two dozen of the older reared cattle, go on the permanent grass, where they get fat during the season without artificial food. In this way about 70 oxen are sold every year, those purchased as steers coming in at about 16*l.* or 17*l.* per head, and going out at 25*l.* to 27*l.* per head.

It will doubtless have been remarked by readers of the last few pages that in the Marsh districts little if any attempt is made to stall-feed cattle in the winter. Several reasons have been given me for this variation from English practice, and all of them contribute their share to the total result. Thus very few turnips are grown, and artificial food is considered too dear, very little account being taken of the comparative value of farmyard-manure made from different feeding materials. Then an important consideration is that, in winter, Hamburg is practically the only accessible market for fat stock, the London trade not beginning until spring is well advanced, although sometimes a few winter-fed cattle are sent over in April. These generally go from the Southern Ditmarsh country, where farmers are beginning to pay more attention to stall-feeding. As an example of the opening for winter-feeding which exists in the Ditmarsh, I may mention that a farmer in the Tonning Marsh informed me that he was in the habit of buying 2½-year-old oxen in the autumn, and, as he has little or no straw, he sends them to be wintered in the Ditmarsh by farmers who have much more straw than can be used up by their own beasts. He pays from 24*s*. to 36*s*. per head for their winter keep, which consists almost entirely of straw, and in the spring they return to his marsh-pastures, where they are fattened off during the summer.

Each marsh has its own aboriginal breed of cattle; but at the present time it is impossible to describe from observation their distinctive characters; as they have been so crossed with Short-

Fig. 12.—*Bull of the Eiderstadt Marsh Breed* (4 *years old*).



horns that they all partake more or less of the characters of the imported breed. The cut on page 374, from a lithograph published in 1847, will give a fair idea of a pure bull of the Eiderstadt race at that time. The colours are roan and white.

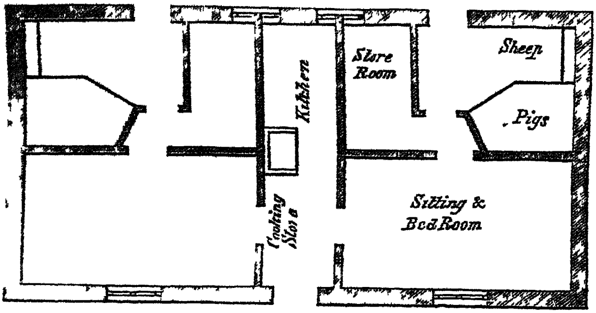
With regard to the importation of cattle into Schleswig and Holstein, it should be mentioned that those Duchies are completely isolated from the other provinces of the German Empire. I was informed that the pike-keepers and road menders are required to examine the papers, or permits, of persons in charge of cattle driven along the roads, and to ascertain that the cattle in their charge are duly authorised to be within the boundaries of Schleswig and Holstein. Time did not permit of my investigating thoroughly this important matter; and it would have been impossible to do justice to the subject in this Report.

THE LABOURER.

Since the date of Mr. Rainals' Report (1860), the upward movement in the price of farm-labour, which had even then begun to attract attention, has made considerable progress in Denmark as in other countries. In the kingdom itself, the farm-servant received, according to Mr. Rainals, 5*l.* 10*s.* per annum, together with board and lodging, in 1860, against 2*l.* 15*s.* to 3*l.* 15*s.* in 1846; and he now obtains from 8*l.* to 10*l.* per annum. These are the unmarried labourers who sleep on the farm, generally in a corner of the cow-shed or stable, or in a small room partitioned off from it. Dairy-maids now earn 5*l.* to 6*l.*, and their food and lodging, while, in 1860, their money-payment was about 3*l.* 7*s.* The married labourers live in cottages on or adjacent to the farm, and Mr. Rainals states that their daily wages "may be estimated at from 10*d.* to 1*s.* 3*d.* for males in the summer, and about 7*d.* in the winter; for females at from 8*d.* to 10*d.* in the summer, and from 5½*d.* to 7*d.* in the winter; but they receive no board or lodging." At present these figures must be increased to from 1*s.* 3*d.* to 2*s.* or more per day for men in summer, and 2*d.* or 3*d.* less in winter; the rent of the cottage varies from 18*s.* per annum in the districts where wages are low to as much as 70*s.* in those where labour is more highly paid. These figures include the rent of a small garden or allotment; but when keep for a cow and a couple of sheep, say 8 or 10 acres, is attached to the cottage, the rent amounts to 5*l.* or 6*l.* per annum. In such cases the cultivation of the land is done by the farmer, who is paid in labour, the wife as well as the man sometimes working in payment of each day's work done by a ploughman and two horses, say 1½ day's labour of both of them. In Holstein, on the other hand, there is a price, fixed by Government I believe, at about 5*s.* per acre, which the labourer pays his employer for the horse-cultivation of his land. Mr. Rainals remarks that "in Holstein wages are a little higher than in the kingdom or in Schleswig;" and this is still true of the marshes, but not of the Geest, where wages are about 1*s.* per diem, the labourers paying about 3*l.* per annum for a cottage and 5 or 6 acres of land.

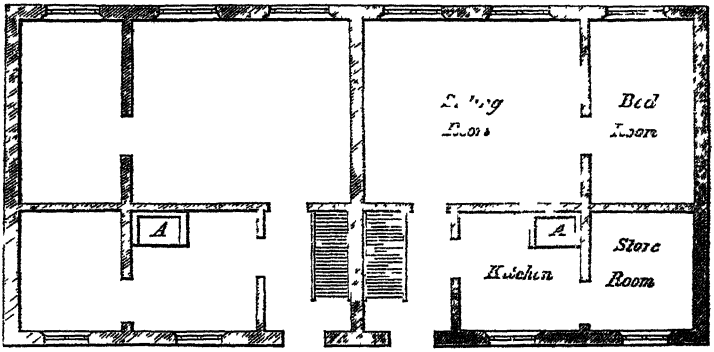
In Denmark and the Duchies certain privileges or perquisites are given to the labourers in addition to their daily pay, the keep for two sheep being most common; and, to eke this out, the labourers carefully mow every green bank and roadside-strip of grass. In the dairy-districts an allowance of skim-milk is not uncommon, and sometimes wood or turf. In the more remote districts of North Jutland the system of payment in kind still lingers, and the following may be given as an example:—23 bushels of rye, 23 bushels of barley, and 5*l.* in money per annum; also cottage and garden rent free, 4 pints of skim-milk daily, food and land for two sheep, turf, and a pig six weeks old. In return the man gives his services, and his wife is bound to work when required for 1*s.* per day in summer, and 9*d.* per day in winter. The following plan (Fig. 13) of two cottages (or rather one cottage for two families) on the farm just referred to, will give a little life to the bare figures I have quoted. The ground-floor of each cottage consists of a single room for the use of the labourer and his family, by day as well as by night, with a store-room, a pig-stye, and a sheep-pen at the back and under the same roof; above this floor is simply a loft for storing winter-supplies of hay, corn, &c. Between the two cottages, but under the continuous roof, is a lobby with a single cooking-apparatus, which is used in common by both families.

Fig. 13.—*Plan of a pair of Labourers' Cottages on the Farm of Mr. Branth, near Aalborg.*



The system of building cottages in pairs is very general in Denmark as it is with us, and the above example is by no means below the average of the old-fashioned style of cottage. The new style of cottage, which is now being built on the best-managed estates, is a great improvement upon them, as may be gathered from the annexed ground-plan (Fig. 14) of a pair which I saw at Mr. Tesdorpf's, on the island of Falster. Part of the loft above was partitioned off as a second bedroom.

Fig. 14.—*Plan of a pair of Labourers' Cottages on Mr. Tesdorpf's Farm at Ourupgaard, Falster.*



A A Cooking-stoves

Mr. Tesdorpf has the welfare of his labourers sincerely at heart, and has exerted himself in many ways for their benefit. Amongst other things, he has established a co-operative store in the village; all the villagers are shareholders, and those who cannot afford to pay money down for their shares, may purchase them by allowing their modicum of profit to accumulate until it amounts to the required sum. The dividend has generally been between 7 and 8 per cent. In the same village and under the same patronage is a benefit society, which includes amongst its objects sick pay, and the securing of medical attendance during illness. Men pay ¼*d.* per week, and their wives half that amount, to secure medical attendance and an allowance of 4½*d.* per day during illness, and larger amounts for a proportionate payment. The village-school is attended by ninety scholars, and the schoolmaster is not behind the rest of the community in his successful devotion to agricultural pursuits.

Ourupgaard must, however, be regarded as a model, rather than a typical, Danish village. In Denmark every person in indigent circumstances has a legal right to poor-relief, and to medical aid in sickness. The system of administrating relief has hitherto very much resembled our own, and the poor-rate has fluctuated in different parishes according to the laxity or the strictness of the poor-law officers. I believe, however, that the whole question is now under consideration, and that considerable modifications of the existing law will shortly be brought before the Danish Parliament. It is to be hoped that those modifications will tend to encourage the development of such excellent institutions as the Ourupgaard Benefit Society and Co-operative Store.

AGRICULTURAL EDUCATION.

As in other Continental countries, the education of the future generation of farmers is carefully provided for. In Denmark, only the higher education is under State management and control, and is provided for at the Royal Agricultural and Veterinary College in the outskirts of Copenhagen. It is not necessary to describe the arrangements of this institution, for, admirable though they are, they do not differ in principle from those of similar institutions in other countries. To the college is attached an experimental farm, which is managed with considerable skill and care. Amongst the experiments which were being conducted at the time of my visit were several series of alternate courses of cropping: for instance, wheat taken in alternate years, the intervening crops being beans, clover, roots, &c.; also barley in alternate years, with the same intervening crops; and again oats, clover, and roots, each treated as the main crop with a series of intervening ones. The clover- and root-experiments were soon brought to an end by the land refusing to grow them in alternate years after a few courses; but the others have now been in operation some time. Experiments were also being conducted on the operation of different manures on different crops; on the effect of drilling at closer or wider intervals, and on the comparative effect of drilling and broadcasting; on sowing various seeds at different depths; and on the length of time that different species of grass and clover, as well as sainfoin and lucerne, can be allowed to stand advantageously when cut every year. Professor Jorgensen, the Lecturer on Agriculture at the College, is very cautious about publishing results, and does not consider it safe even to draw conclusions from experiments until they have been repeated ten years consecutively. No doubt he is wise, and when his record is published his caution will make it the more valuable.

What may be termed "primary" agricultural education is fostered by the Royal Danish Agricultural Society—a private institution with a State subvention. Its educational efforts have been carried out on an extensive scale, and with great success. The system pursued is similar to that already described in my Report on Sweden. A certain number of farms distributed throughout the country are registered by the Society as places to which pupils can be sent. The pupils are expected to work in the same manner and to the same extent as the hired labourers, and thus earn their living and a small wage besides. There are four classes of pupils, viz.: (1) Agricultural; (2) Draining; (3) Dairy management; (4) Practical dairying.

According to the Society's Report for the year 1872, there were 77 farms at which agricultural pupils were received to the number of 170, of whom 127 remained at the close of the year. Some of these were one-year students, some two years, and others three years, the numbers of each grade not differing very remarkably. The payment to the pupils is 3*l.* 6*s.* 9*d.* the first year, 4*l.* the second, and 4*l.* 9*s.* the third. After the third year they may obtain the Society's diploma, and the most successful receive a grant in aid of a journey to Scotland or some other country. During the year 1872 nearly 150*l.* was thus spent by the Society. Instruction in dairy-management was given in 1872 on 11 farms to 20 pupils, of whom 15 remained at the end of the year. Practical dairying was taught at 17 farms in that year to 26 pupils, of whom 14 were continuing their course of instruction at the close of the year. The course of instruction in the dairy classes is of two years' duration, and the Society pays the head dairymaid 4*l.* 9*s.* for each pupil.

The Society was established in 1769, and its educational efforts commenced in 1820 with the agricultural farm-schools; and the success of the movement, especially after the first decade, led to the establishment of the system for teaching practical dairying in 1836. Thus by the aid of the above figures, the influence which the Society has exercised upon the agriculture of the kingdom may be estimated. Taking an average of 40 instructed young farmers, 10 practical dairymen, and 12 or 14 thoroughly competent dairymaids, added annually to the agricultural ranks of a population numbering only a million and three-quarters, and continued for a series of years, the result must be to produce a certain uniformity of practice throughout the country. The practice will be good, bad, or indifferent, according to the nature of the precept and example put forward at the schools; and the preceding pages will doubtless lead English readers to infer that while the dairy-schools have been an enormous benefit to the country, the system of husbandry taught at the farm-schools has interfered with their successful advancement of Danish agriculture.

CONCLUSION.

Readers of this Report who remember the previous one on Sweden will have noticed that the agricultural practices of the two countries are essentially the same in principle, but differ in the details which have already been pointed out. The results obtained in Denmark are much more favourable than those noticed in Sweden—a difference which the comparative mildness of the climate would lead one to expect. Land in Denmark has about three times the value it possesses in Sweden (excluding the province of Scåne), and farmers get almost a corresponding increase in the yearly excess of receipts over payments, which represents their rent, interest of capital, and farmer's profits. In the *Geest* district of the Duchies, rents, profits, and crops are all lower than in the monarchy; but in the fertile marsh districts large prices are paid for land, and good results are obtained.

Agriculture is most advanced in the Danish islands, and in those districts may be seen some of the most approved farm-implements of English and American manufacture, while on Laaland the only steam-ploughs in the kingdom cultivate the land attached to a large beetroot-sugar factory. Ploughs and threshing-machines by all our great English firms may be seen on the home-farms of most large proprietors, but the favourite reaper appears to be the "Buckeye," an American machine of great repute throughout Scandinavia. Against this flattering picture we must put the facts as they are seen on smaller farms, whether owned or rented by the occupier. In the former case, the owner too frequently has not the means to purchase improved machinery; and in the latter, the inventory belongs to the landlord, who rarely feels inclined to incur an expense that may be avoided, while his tenants—the Bönder—who have the best of the bargain in security of tenure and low rents, naturally follow the practices of their forefathers, in the absence of any inducement to the contrary. These barriers to the introduction of better ploughs than those of native manufacture, and of such implements as horse-hoes and scarifiers, which the foul condition of the land renders almost essential to its profitable cultivation, though they cannot be removed, might be to some extent surmounted. The first step is to provide that such implements may be purchased at a moderate cost; but hitherto the Government of the country, by levying a considerable import-duty, has exerted its influence in the opposite direction.

With regard to manures, little need be added to the remarks made from time to time in the body of this Report. As in Sweden, so in Denmark, the artificial manures employed are almost entirely confined to superphosphates, although dissolved bones and dissolved guano are now beginning to be used. Ammoniacal manures are almost unknown, and top-dressings rarely, if ever, heard of. Artificial feeding-stuffs consist principally of rape-cake and palmnut-cake, which are preferred to linseed-cake for milch-cows; but in the meat-making districts a certain amount of linseed-cake is used by the best farmers in small quantities. The use of linseed-cake in large doses for finishing off fat bullocks is very little known; and the practice of making the stall-feeding of cattle the finishing process is almost confined to the dairy districts.

Another great divergence from English practice is to be found in the system of consuming so large a proportion of the home-grown crops on the farm.

In Great Britain farmers try to produce corn of fine quality that will pay to sell, and to sell it, purchasing back feeding-stuffs which cost less money for a given amount of feeding and manurial matter. In Denmark, as in Sweden and Norway, most of the corn grown is consumed on the farm, the only kinds sold being the best of the wheat, and sometimes a proportion of the barley, the bulk of the produce being used for feeding dairy-cows, pigs, and horses, especially during the winter.* Thus Mr. Vallentiner sells, off 780 imperial acres of good land, dairy-produce to the amount of 2200*l.*, or nearly 3*l.* per acre; while his sales of corn amount to only 1800*l.*, or less than 50*s.* per acre. Mr. Vallentiner is one of the best farmers in Sealand, and his sales of corn are far larger in proportion than most farmers make, partly because he gets very good crops, and partly because he buys 15 tons of rape-cake annually, besides a large quantity of bran.

The differences of laws, customs, and climate which have been described in this Report make a comparison of the results of Danish and English farming a somewhat difficult and uncertain calculation. However, the figures given in the preceding pages, as well as those previously published by Professor Wilson, lead one to doubt whether M. Tisserand's prediction that Danish farmers will "extract a higher profit from their land" than English occupiers is likely to be verified, unless they alter their system of farming in some essential particulars.

In conclusion, I wish to express my thanks to all whose names occur in the foregoing pages, and to many other Danish gentlemen, for their uniform kindness and hospitality.

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* The English system is assumed in the recently enacted "Agricultural Holdings (England) Act, 1875," section 5 of which provides for compensation to the occupier for the unexhausted manure produced by the 'consumption on the holding by cattle, sheep, or pigs, of cake or other feeding-stuff *not produced on the holding*.' This provision will meet the wants of the great majority of English farmers; but in Denmark it would be inoperative, as very little feeding-stuff is purchased; but from one-half to two-thirds, or more, of the corn grown is consumed on the holding.

XIV.—*Roads and Highways; their History, Construction, Cost, Repair, and Management.* By W. H. Wheeler, Member of the Institution of Civil Engineers.

HISTORY OF ROAD-MAKING.

A FACILITY of locomotion is one of the first necessaries of a civilised state of society, and the more advanced the condition of any country, the greater is the demand for the means of transporting produce and manufactures from one locality to another, and for rapid intercourse and intercommunication.

Railways have, to a certain extent, superseded roads as the chief means of transport, but the local utility of a railway must depend on the convenience of its lateral feeders. The produce of the surrounding district must still be conveyed to the railway by means of roads. As the tiny rivulet and the brook gather together the water from the surrounding country and conduct it to the river, which in time becomes a mighty stream, so must the material which is to be carried by the railway first be collected and conveyed along the highways of the country before it can reach the main trunk.

Road-making is entirely an attribute of a civilised country. It denotes a settled population and an increase of wants. To the Arab, and the wild inhabitant of the desert, whose nomad life renders such a thing as an accumulation of property a simple impossibility, and whose whole worldly substance consists of his horse and his tent, a road is a thing unknown and unwanted. Consequently, even to this day, the traveller in some Eastern countries will seek in vain for a properly formed road, or any of those accessories which are considered necessary to locomotion in more settled countries.

From history we learn that road-making on scientific principles was practised by the Carthagenians, from whom the Romans learnt the art, and they improved on the method of their teachers. The great Roman engineers, having first connected their mother-city with all the principal towns in Italy by a splendid system of highways, subsequently made it their first concern in all their conquests, as a matter of military expediency, for the rapid removal of their legions, to lay out a system of roads on a plan which was subsequently followed by ourselves in the Highlands of Scotland and in South Wales. The Roman roads were carried in a direct line from one town to another, over hill and valley, and were made in the most permanent and substantial manner. The remains of those roads have been discovered in a state of preservation sixteen centuries after their formation. Their construction consisted of a pitching of large stones evenly placed and bedded together, covered with concrete, and coated with a layer of broken stones and gravel. The plan pursued by those ingenious and common-sense people, in all their large engineering works, of employing their soldiers, and under them their captives and convicts, enabled them to carry out schemes of road-making, embanking, and water-supply, in a manner which is still the wonder and envy of modern nations.

The highly civilised state to which the aboriginal inhabitants of Central America attained led them to the construction of good and permanent roads. Cortes and Pizarro found on their arrival in Mexico and Peru a complete system of highways. The Peruvians, more especially, had developed their system, by connecting their principal towns with substantial roads. One of these, which passed over the mountain-chain of the Andes, was nearly 2000 miles in length, and is described by Prescott as being conducted over pathless sierras covered with snow, galleries being cut for leagues through rocks; rivers crossed by means of bridges that swing suspended in the air; ravines of hideous depth filled up with solid masonry; in short, all the difficulties which beset a wild and mountainous region, and which might appal the most courageous engineer of modern times, were encountered and successfully overcome. The road was built of heavy flags of freestone, and covered, in parts at least, with a bituminous cement, which time has made much harder than the stone itself. In some places, where the ravines had been filled up with masonry, the mountain-torrents, wearing on it for ages, have gradually eaten a way through its base, and left the superincumbent mass (such is the cohesion of materials) still spanning the valley like an arch.

The barbarous tribes who completed the destruction of the Roman Empire, and drove that people from all their conquests, were ill-suited and less inclined to foster or preserve the works of art with which the Romans had stamped their presence in all those lands where their victorious army had led them. War, plunder, and rapine, constant quarrels leading to the burning of villages, the cutting of embankments, and ruinous destruction of all works, was the occupation of our Saxon and Danish predecessors; and the blow thus given to the march of civilisation was many years before it was overcome.

As the country became more settled after the Norman Conquest, towns acquired charters, and with them power and independence. Commerce began to flourish; a settled population acquired habits which led to wants before unknown; and the transport of merchandise from the coast to the inland towns, and from one special seat of industry to another, soon made the want of roads severely felt.

Very many years passed before any systematic attempt was made to maintain and improve the highways of the country; occasional instances, however, are recorded of the construction of roads by the various monasteries. The introduction of wheel-carriages, in the early part of the seventeenth century, caused the wretched condition of the horse-tracks, by which communication had been kept up, to be severely felt; and the introduction of stage-coaches, in the reign of Charles I., rendered it absolutely necessary that some measures should be taken to render the roads passable. It was not until the middle of the eighteenth century that any really efficient roads were constructed.

The first attempt at systematic road-making was in the Highlands of Scotland, where, after the rebellion of 1715, the soldiers were employed under General Wade in constructing the great military highways by which access was gained to those parts of the Highlands which had hitherto proved almost inaccessible to the army, and by means of which, not only were the Highland chiefs subdued, but the prosperity of the country was very materially advanced. The roads thus constructed were 800 miles in length. The advantages which ensued from their construction gave a stimulus to road-making throughout Great Britain, so that from 1760 to 1774 upwards of 400 Acts were passed relating to the formation and repairing of roads.

The first English road-engineer was a blind Yorkshireman, Metcalfe, a man of innate shrewdness and ingenuity, with great resoluteness of purpose, who in his career had acquired a more than ordinary share of experience. His first connection with road-making began in 1765, when, an Act having been obtained for the construction of a road from Harrogate to Boroughbridge, he contracted for the construction of three miles of the new road. This was followed by the erection of a bridge; after which he was for upwards of thirty years engaged in similar occupations in Yorkshire, Lancashire, Derbyshire, and Cheshire. Metcalfe fulfilled the functions of designer as well as constructor, and personally surveyed and laid out many of the most important turnpike-roads, involving the building of bridges, retaining walls, and culverts.

Smeaton, the father of engineers, was engaged as a road-maker during part of his career, having been employed in 1768 in making a new road in Nottinghamshire. The great main arteries of the country were laid still later, in the beginning of the present century; and Mr. Telford, the founder of the Institution of Civil Engineers, then introduced his well-known system, which has not yet been improved on. Mr. Telford's first undertaking was in Scotland, whither he was sent by the Government to report as to the best means of improving the fisheries, and to design such works as would tend to the development of the resources of the country, in order to check the tide of emigration. Mr. Telford's Report advised the opening out of the country by a complete system of highways—so as to bring the interior parts into communication with the great towns and the coast,—and the construction of harbours for the protection of the fishing-vessels. Mr. Telford's views having been adopted, a Board of Commissioners was appointed, with Mr. Telford as their engineer. Under their direction, 920 miles of roads were laid out and constructed during a period of about eighteen years. These roads, owing to the hilly and rugged nature of the country, involved works of great magnitude, the extent of which may be estimated from the fact that on their course 1200 bridges were built, some of which were as ingenious in construction as beautiful in design.

From Scotland Mr. Telford extended his operations to the south, where many of the roads which were laid out in the latter half of the previous century had been so badly constructed as to require remaking. In 1815 he was engaged under Government upon one of the finest pieces of road-making in the world (the Shrewsbury and Holyhead line), and, in connection with it, in the construction of the Menai and Conway suspension-bridges. This road, lying on the direct line of communication between England and Ireland, was considered of sufficient importance to be deemed a national undertaking.

Contemporaneous with Telford was Macadam, whose attention was first directed to road-making when he was a trustee of a road in Ayrshire. He subsequently devoted himself with great enthusiasm to road-making as a profession. In 1815 he was appointed Surveyor-General of the Bristol roads, in which position he introduced that system which has ever since been distinguished by his name. Macadam's plan mainly consisted in the use of small angular pieces of hard stone, carefully spread on the surface of the road, and so manipulated as to form a hard, even, and durable surface—a thing never before attempted in those days. In carrying out his improvements Mr. Macadam spent his whole fortune; but in consideration of the benefits which they had conferred on the country, by saving animal labour, facilitating commercial intercourse, and rendering travelling easy and expeditious, the money thus expended by him was repaid by order of the House of Commons, together with a further sum of 2000*l.*, as an acknowledgment of the services he had rendered.

With the termination of Mr. Telford's career, road-making, as an art, begun to decline; the introduction of railways changed, for a time, the stream of traffic from the turnpikes; and the trusts had frequently no money to pay the interest of their debts, and often even barely sufficient to maintain the roads.

LEGISLATION.

Roads seem to have first engaged the attention of the Legislature in 1285, when a statute was passed which had more reference to the prevention of robberies on roads than to the roads themselves. In Edward III.'s reign an Act was passed authorising the levying of tolls for the repairs of the road leading from St. Giles to Charing Cross, and in subsequent reigns other local Acts were sanctioned. In the reign of Queen Mary the first attempt at general legislation was made, and the foundation of our present system of highway management was laid. By this Act every parish was to elect two surveyors to see to the maintenance and repair of the roads by compulsory labour.

Under the simple system of the common law, the onus of maintaining a highway was on the inhabitants of the parish in which it was situated, who were bound by actual labour thereon to put it in good order when it was out of repair.

Under the ancient system of tenures the lord of the soil frequently claimed the privilege of receiving tolls from all who travelled along his highway, in consideration of which he was liable to keep the way in good order, and in some countries even to defend the passengers from depredation.

Previous to the passing of the Act 5 and 6 William IV. c. 50, the highways were, under the provisions of certain statutes passed in the reign of George III., kept in repair by the performance of statute-duty. Every person occupying lands, &c., not exceeding the annual value of 50*l.* and keeping a cart or waggon, was liable to send, for six days in every year, at such time and place as the surveyor might appoint, one cart with horse or oxen, and two able-bodied men with the same, and so in proportion for the value of the land occupied. Those persons who did not keep a team, but occupied an estate under the yearly value of 50*l.*, were obliged to contribute, in lieu of such duty, a certain sum in respect of every 20*s.* of the yearly value.

As trade and commerce increased, and locomotion became more necessary and common, the inconveniences and delays occasioned by the indifferent state of the ordinary highways of the country, and the circuitous route they involved, were very severely felt. It was, however, left to private enterprise to supply the remedy; new main roads leading direct from one large town to another were constructed, the money being provided by the landowners and other interested parties, who in return were allowed to take toll for the use of the road—hence the origin of turnpike trusts. According to the Parliamentary Report of 1840, the number of trusts then in existence was 1116; the number of toll-gates and side-bars, 7796; the average extent of each trust was about 19¾ miles; the amount of mortgage debt was 7,260,993*l.*; and the highest amount received for tolls was in 1837, amounting to 1,509,985*l.* These figures have since been gradually declining, till, according to the last-published return, 1873, the debt was reduced to 2,056,985*l.*, and the annual interest to 57,280*l.*; the number of trusts left being 712.

Roads, being a necessity in any civilised country, ought to be free to every one, and their maintenance should be under local or imperial direction. The practice of allowing the money necessary for repairs and repayment of the capital expended on the road to be raised by a toll assessed on the user, was, at the best, an expedient justified by the fact that it rested between that method or none at all; and it was recognised by the Legislature only as a temporary measure, the inconveniences of which were sought to be met by granting the charges on the roads for a limited period. The debt in many cases has been paid off, and the toll-bars abolished, the maintenance of the roads having been thrown on the several parishes through which they pass; many trusts yet remain, some gradually working off their debts, others hopelessly insolvent, all involving considerable charges on the districts through which they pass, beyond their maintenance, for the payment of toll-collectors, clerks, law-charges, and other expenses. Parliamentary committees have decreed that tolls are an expensive and inconvenient mode of levying money; and that, in order to obtain a more economical and efficient management of the roads, it is absolutely necessary to resort to some system of consolidation.

The chief difficulty in dealing with this question is the bonded debt, which, in the last return (1873) amounted for England and Wales to 2,056,985*l.*, paying interest, in the aggregate, of 57,280*l.*—the rate varying from 1¼ to 5 per cent. From the report made in 1865 there were then 1046 trusts in existence, 182 of which were free from debt. The unpaid interest amounted to 456,708*l.*; 47 trusts had unpaid interest amounting to nearly half their bonded debt, and 141 trusts had not paid any interest for fifteen years.

As the several trusts expire, the roads are handed over to the parish authorities, and the officers who had gained experience in their management are replaced by the ordinary highway surveyor.

Whatever may have been the inconvenience of tolls, there is no doubt that turnpike-roads were originally well constructed, and have since been much better maintained than ordinary highways. This was chiefly due to the more responsible nature of the governing body, and to the fact of their employing a skilled and permanent officer as surveyor of the roads.

In South Wales, the riots, which arose from the objection of the inhabitants to toll-bars, led to the adoption of a system of highway districts, under an engineer-officer appointed by Government, and resulted in the maintenance of the roads on a correct and uniform plan. But in England, each parish has been allowed to pursue its own devices; and road-making, which in Telford's time began to assume the importance which it deserved, has since then been gradually neglected as a scientific pursuit.

Under the present law the highways are placed under the care of the vestry of each separate parish, which delegates the duty of superintendence to one of the parishioners, who is elected annually to fill the office of surveyor, little or no regard being paid to his qualifications for the office. The defect of this system is obvious; the length of the road in each parish is not sufficient to occupy the time of a paid officer, and the constant change of superintendents prevents the following out of any systematic mode of treatment. The surveyor elected this year may be zealous and painstaking, but he has his work to learn; and however well he may fulfil his duties, all the good that he has done may be undone by his successor, who, with a narrow parsimonious view, or a wish to please some part of the parish, may save the funds by neglecting the roads; or, even if he be well-inclined, his utter disqualification for the office may have the same effect. Even where the same surveyor is continued year after year, if he is competent—and very few are—he is controlled in all his actions by a vestry, whose apparent object is to keep the rates as low as possible, and who have too little knowledge to realise the fact that a well-done work is the most economical.

The report of the special committee, which sat as far back as 1819, says: "There is no point upon which a more decided coincidence of opinion exists amongst all those who profess what may now be called the science of road-making, than that the first effectual step towards general improvement must be the employment of persons of superior ability and experience as superintending surveyors. The duties of surveyor demand suitable education and talents; and some skill in the science of an engineer should also be regarded as a valuable qualification. These qualifications must be fairly remunerated; and it is evident that the limited extent of the funds of trusts in general do not afford the means of paying to such an officer an adequate salary. The difficulty might, in many instances, be obviated by voluntary associations; but when the system is wished to be universal, it ought not to be left to so precarious a dependence."

The Highway Act of the present reign, sanctioning the formation of highway districts, allows a sufficient length of road to be brought under one jurisdiction to warrant the employment of a regularly qualified and paid officer. Thus, while ensuring uniformity of management, economy is effected, yet the mixed composition of the Board prevents a parsimonious expenditure of the funds.

The desirability of forming several parishes into districts for road purposes has been admitted by all the committees which have reported on the subject for the last thirty or forty years. The select committee of 1838, in their report, recommended, "That the formation of parishes into districts should be compulsory," and that "they should be co-extensive with the district formed under the direction of the Poor Law Commissioners." They also recommended that the Board of Guardians should constitute the Board to direct the repairs of the highways, "inasmuch as under the Board of Guardians there already existed an establishment of skilful and responsible paid officers, who act as clerks, auditors, and treasurers, which, at a very trifling increase of expense—if any—could be made applicable" to the management of roads.

COST OF MAINTENANCE.

From the Report of the Commissioners for inquiring into the State of the Roads in England and Wales, made to Parliament in 1840, it appears that the length of highways then in existence was 104,770 miles, in addition to 22,000 miles of turnpikes. The average expense of maintaining the highways at that time was 11*l.* 3*s.* per mile, and of the turnpikes 45*l.* per mile. Since then, 348 districts, containing 59,808 miles of roads, have been formed under the Acts 25 and 26 Vict., and 27 and 28 Vict.;

and the number of turnpike-trusts has diminished from 1116 to 712.

From the returns made annually to Parliament, the cost of the roads in England and Wales during the year 1873, the last return published, was as follows:—

	Highways	Highway Districts	Turnpikes
	£	£	£
Manual labour	223,010	279,590	188,230
Carting	109,601	117,345	58,177
Materials	222,306	203,730	109,883
Tradesmen	39,956	25,789	19,964
Salaries, Management, Law charges, &c. ..	22,648	67,077	57,156
Contributions to turnpikes	8,549	26,387	..
Repairs of roads formerly turnpikes	..	120,501	..
Improvements	..	24,598	10,670
Interest and repayment of loans	..	5,197	207,372
Sundries	28,077	16,461	19,646
	654,147	891,675	671,098

making the total annual cost of the roads two and a quarter millions of money. The length of the highways and turnpikes not being given, and the expenditure on the districts being mixed up with the turnpikes under their care, the mileage of which is also not given, it is impossible to compare the relative cost of each kind of management; but from a return made in 1866, it appears that the cost per mile of the several items of expenditure on 52,748 miles of highways then formed into districts was as follows:—

	£	s.	d.	£	s.	d.
Manual labour	5	0	3			
Team work	2	4	0			
Materials	3	4	6			
Tradesmen	0	11	6			
				11	0	3
Salaries	1	3	0			
Turnpike contributions	0	4	8			
Sundries	0	4	4			
				1	12	0
Total per mile				£12	12	3

The relative percentage of the principal items of expenditure as compared with the totals, from the 1866 returns, after estimating the special expenditure on improvements, &c., is as follows:—

	Highways, per cent	Highway Districts, per cent.	Turnpikes, per cent.
Labour	36	42	36
Carting	25	16	14
Materials	27	24	25
Management	3	9	13

Nearly the same proportions hold in the 1873 return for the highways and turnpikes, the alteration being an increase in the cost of materials and a decrease in carting.

CONSTRUCTION.

Having thus given a general outline of the history and present condition of the roads, it will be desirable in the next place to treat of the method of their construction.

The plan pursued by Telford, the greatest road-engineer of the present century, in the construction of his roads, was first to level and drain the bed, then to lay upon it a solid pavement of large stones, and on this a layer of stones carefully broken, and over all a little gravel, or other fine material. This was the plan pursued in the Highlands. But where much and heavy traffic was to be provided for, a more thorough and careful system was pursued, which may be best illustrated from Telford's specification for the Carlisle and Glasgow road. The middle portion of the road was rendered as firm and substantial as possible by first forming a paving of large stones, taking the best the neighbourhood afforded, whether sandstone, limestone, or whinstone, and having them all carefully laid by hand on a bed formed to the proper contour of the road, and previously well provided with drainage. All the inequalities were broken off the tops of these stones, and the cavities filled in. The size of the stones was about 7 in. × 3 in., and they were all cross-bonded. Over this paving was placed a layer of whinstone 7 inches in thickness, all properly broken; so that no stone should exceed 6 ounces in weight, and that each should be able to pass through a circular ring 2½ inches in diameter. This layer was again covered with a binding gravel, sufficient to fill up the cavities between the broken stones. Great attention was paid to this road until it became thoroughly solidified, and then it stood without repair for many years, one of these roads requiring nothing to be done beyond cleaning the dirt off for six years after its construction.

Mr. Macadam's system differed from Telford's in this material point. The latter sought to obtain a hard, unyielding surface; and hence his first formation of paving. The former, however, thought a certain amount of elasticity admissible, if not desirable. After the formation and drainage of the bed of the road, he covered it several inches in depth with a coating of hard stones, broken into angular fragments. This was watched by men; and, as ruts or inequalities formed, they were raked and levelled, and fresh material added, until a hard and level surface was obtained. The material he used for coating was the hardest that could be obtained, preference being given to granite, greenstone, or basalt.

While Telford's was the most thorough, Macadam's was the more economical in first cost.

The great art is so to construct a road that, while a uniform surface is maintained, and the wet not allowed to penetrate from the top, the dirt also cannot be forced up through the road-material from its base. With this view an experiment was tried on the Highgate Archway Road of forming the foundation with concrete, composed of one-tenth of Roman cement, one-tenth of sand, and eight-tenths of stones or gravel, laid 6 inches thick over the central part of the road for a width of 18 feet; on this a covering of broken stones, 3 inches thick, was laid, and a hard and durable road was the result. The cost was from 12*s.* to 15*s.* the running yard.

On the Brixton roads Mr. Penfold used a concrete composed of four parts of gravel to one of lime, laid 6 inches thick, extending over half the road, and covered with 6 inches of broken stones.

Few modern roads have the same care and attention bestowed on them as Telford gave, the practice now being generally to lay a foundation of such rough, dry material as can be most easily obtained. In some localities chalk is used, in London often the screenings from ash-yards; burnt clay is also frequently made use of. All these materials are liable to objections unless special precautions are observed in their use.

Chalk, on account of its affinity for water, readily absorbs moisture, which expands in freezing, and bursts the chalk into atoms, which the succeeding thaw changes into mud. Unless, therefore, the chalk is covered with a sufficiently thick coating of gravel or other material, in winter it forces its way up to the surface, and makes a soft, loose, and dirty road. The screenings of ash-yards being composed of materials of different degrees of hardness, many of which soon decay and rot away, afford a very bad foundation, and soon leave the superstructure full of cavities and inequalities. Burnt clay, although a dry and porous material, if not sufficiently covered with gravel, becomes in wet weather spongy, and forces its way to the surface, rendering the road loose and dirty. Clay burnt to the consistency of bricks, in lumps of about the same size, and then broken up, or old brick-bats free from mortar, form an excellent foundation. The guide in the selection of materials must be the geological formation of the neighbourhood, care being taken to select the hardest and most durable materials to be procured.

One very important matter for consideration in the formation of a road is the transverse form that is to be given to the section, which, while it should be sufficient to void the rain that falls on it, should not be so convex as to throw the vehicles rolling over the road too much out of the vertical position when moving along the sides. Roads of too convex a form always wear badly. The tendency of the wheels passing along them is to slide in a lateral direction; and consequently, in addition to the wear and tear due to gravity, and to the friction of the wheel in a longitudinal direction, there is a much greater wear from the grinding of the wheel sideways, which disturbs the crust of the road by pushing the materials out of their place.

Convex roads compel the whole of the traffic to pass along one track in the centre, because it is there only that the vehicle stands upright; the consequence is that three furrows are made, in which the water always stands.

The section adopted by Telford was a fall of 6 inches from the centre to the water-table in a road of 30 feet wide. The contour of the surface was not the segment of a circle, but fell half an inch at 4 feet from the centre, 2 inches at 9 feet, and 6 inches at 15 feet.

Mr. Macadam considered that in a road 18 feet wide, the centre should be only 3 inches higher than the sides.

The chief object in the construction of a good road is to facilitate the locomotion of vehicles by reducing the traction. With this object it becomes necessary, in carrying out a line across a country, to counteract as far as possible the labour due to gravity in raising the vehicles to the tops of hills, and in lowering them again to the valleys. It is obvious that in drawing a vehicle over a hill, the horses have to perform work, in addition to the ordinary friction, equivalent to lifting the whole weight of the vehicle and its contents a height equal to the vertical rise of the hill, and in descending their work is equivalent to counteracting or holding back this weight from the same height.

In Law's 'Treatise on Roads,' a very elaborate Table is given, showing the comparative disadvantage of hilly roads from gradients of 1 in 600 up to 1 in 7, both for light and heavy traffic, from which it appears that hills act more disadvantageously on the heavy than on the light traffic. From these Tables the equivalent length of road, so far as the mechanical power required for the traction is concerned, with an inclination of 1 in 30, compared with a level one, is as 1 is to 2·7 miles for a heavy load; and for a light load as 1 is to 1·6. With a road having an inclination of 1 in 12 the proportions are as 1 is to 5·2 and 2·5 for heavy and light traffic respectively.

In an uneven country, hills cannot be altogether avoided; nor is it necessary that the expense of forming a dead-level should be resorted to, as the occasional change of exertion from one set of muscles to another affords a certain amount of rest to the horses, while the inclination of the road assists materially in the escape of the rainfall. If roads with an inclination are so neglected as to allow the formation of ruts, these form channels for conveying this water away, which otherwise would remain stagnant, and render the surface soft and yielding. Mr. Walker, in his evidence before the Parliamentary Committee on Roads, stated that he considered an inclination of 1 in 80 was desirable for this purpose.

The actual inclination must depend upon local circumstances, which alone can form a guide as to the most expedient gradient to be adopted. As a rule, it may be taken that the angle of inclination should correspond with the angle of repose, or that at which a carriage would not quite roll down by its own gravity. This, on a good road, is about 1°·25′, or a rise of 1 foot in every 40 feet horizontal. At this inclination it is safe for a horse to trot downwards with a light carriage at the rate of 12 miles an hour, and it is not sufficient to impede his speed in rising. An inclination of 1 in 24 should never be exceeded, but the nearer the approach of the gradient to the angle of repose, the more satisfactory is the result.

Inclinations of 1 in 12 are not uncommon on some of our main roads, and Telford found many of the roads in Wales with gradients of 1 in 6, which he reduced on his new line to 1 in 20. In Law's 'Treatise on Engineering,' the annexed Table of the angles of resistance on roads, composed of various materials, is given, and is calculated from experiments made by Sir John MacNeill.

An important point for consideration in the management of roads is the traction or actual power required to overcome friction and other resistance in moving the vehicles. This varies considerably with the condition of the road, the class of vehicle, and the rate of speed. Speaking generally, it may be said that the harder and more level the surface, and the more solid the foundation, the less the tractive power required.

	Limiting angle of resistance.	Greatest inclination which should be given to the road.
Well-laid pavement	0° 50′	1 in 68
Broken stone surface, on a bottom of rough pavement or concrete	1·11	1 in 49
Broken stone surface laid on old flint road	1·40	1 in 34
Gravel road	3·45	1 in 15

From experiments made by Sir John MacNeill and others, it has been ascertained that the resistance on various kinds of roads, is as follows:—

	Force in Pounds required to move a Ton. lbs.
On a railway	8
On a well-made pavement	33
On a road made with six inches of broken stone of great hardness, laid either on a foundation of large stones set in the form of a pavement (Telford's plan), or upon a bottoming of concrete	46
On an old flint road, or a road made with a thick coating of broken stone laid on earth	65
On a road made with a thick coating of gravel, laid on earth..	147

The following general rules have been laid down by Mr. Morin, after experiments made at the expense of the French Government.

1*st.* The traction is directly proportional to the load, and inversely proportional to the diameter of the wheel.

2*nd.* Upon a paved or hard Macadamised road, the resistance is independent of the width of the tire, when it exceeds from 3 to 4 inches.

3*rd.* At a walking pace the traction is the same under the same circumstances for carriages with springs and without them.

4*th.* Upon hard Macadamised, and upon paved roads, the traction increases with the velocity; the increments of traction being directly proportional to the increments of velocity above the velocity of $2\frac{1}{4}$ miles per hour.

The equal increment of traction thus due to each equal increment of velocity is less, as the road is more smooth and the carriage less rigid or better hung.

5*th.* Upon soft roads of earth, or sand, or turf, or roads fresh and thickly gravelled, the traction is independent of the velocity.

6*th.* Upon a well-made and compact pavement of hewn stones, the traction at a walking pace is not more than three-fourths of that upon the best Macadamised roads under similar circumstances; at a trotting pace it is equal to it.

7th. The destruction of the road is in all cases greater, as the diameters of the wheels are less, and it is greater by the use of carriages without springs than by the use of those with springs.

These results most satisfactorily demonstrate the fact that the better the roads the less the traction, and the greater the economy of labour.

REPAIR.

In treating of the repair of roads, they may be divided into two classes, the first being those which have to endure the heavy traffic of towns and their immediate neighbourhood; and the second, those subject only to provincial and agricultural traffic.

The attrition caused by the wheels of the thousands of vehicles which pass over our town roads, many of them carrying weights of several tons, produces an immense amount of wear and tear, and necessitates frequent and expensive repairs. The thickness of the material thus converted from the hardest known rocks into mud and dust was stated at the inquiry into the state of Birmingham, before the Inspector of the General Board of Health, at 4 inches over that part of the surface exposed to the most wear, and 2 inches over the whole in the course of one season. The difficulty of replacing this material, and combining effectiveness of repair with consideration for the users of the road, has been a matter of much discussion. While all admit that only the hardest, and at the same time the toughest material procurable, should be used, the method of placing this on has given rise to a variety of suggestions. The plan ordinarily followed of putting on the road a coating of stone from 3 to 4 inches in thickness, and leaving the horses and vehicles to consolidate it, is desirable neither for the road nor the passengers. Until the surface is worn down, traction is immensely increased, and consequently horse-power wasted. The loose stones are a discomfort and annoyance to passengers, and are injurious both to the feet of the horses and the springs of the carriages. This process fails to produce a hard and even surface, consolidation being effected only by the squeezing together of the stones by the wheels of the vehicles, and the chipping off or wearing away of their sharp edges. As continual raking is necessary to keep the surface level, in the course of time every stone becomes submitted to this chipping-process, and ultimately the road-material resembles pebbles more than angular cubes of stones. The advantage derived from each stone fitting against, and being wedged compactly up to its neighbours as in a piece of mosaic work, where no space is left for water to penetrate, is thus destroyed, as this effect can only be obtained with stones of an angular shape. To prevent this damage, the newly-laid stone is often covered with gravel, which fills up the interstices, and causes the surface at once to become set and firm. If this is followed by rolling, a thoroughly smooth and impermeable surface is at once formed. The application of steam to this purpose, by doing away with the objection arising from the displacement of the stones by the feet of the horses used in moving the rollers, has placed at the disposal of road surveyors the means of repairing roads in a thoroughly efficient manner.

The main objection to the application of gravel, or screened granite, for the purpose just described, is the necessity of subsequently removing a great portion in the shape of mud; but the interstices must be filled in some way to prevent the lodgment of wet, and to fix the stones. It is better to supply this, rather than allow it to be supplied by the wearing away of the road-material.

The great essential in the economical maintenance of roads is to keep them clean, and free from mud and wet. Nothing destroys the surface of a road more than allowing the mud arising from the wearing away of the material, and the droppings of the horses, to remain on the surface. In winter it acts like a wet blanket, preventing the sun and wind from drying the road; and in summer it causes clouds of dust which, blown about by the wind, are not only a source of physical discomfort, but have a very detrimental effect upon health, by conveying to the lungs organic and mineral matter of a highly injurious character.

On highways repaired with limestone and similar soft material a great deal of cleaning is necessary. For this purpose several machines have been invented, by which the work is accomplished at much less cost than by hand-labour. It has been estimated by the makers of these machines that the cost of removing dirt from roads by hand-labour varies from 20*s.* to 30*s.* per mile, whereas the same man can accomplish the same amount of work with a scraping-machine for from 4*s.* to 6*s.* The cost of a hand-machine is about 3*l.* 10*s.* Horse scraping-machines are also made, which are stated to scrape 10,000 superficial yards per hour, the horse moving at the rate of three miles an hour. The cost of the machine, which is supplied by Messrs. Smith and Son, of Barnard Castle, is 15*l.*

A machine has also been invented by the same firm for sweeping roads by horse-power, which, according to the statement of the makers, is capable of sweeping 15,000 yards in an hour. It consists of a circular brush, which revolves by means of gearing attached to the wheels, and being placed at a slight angle with the axle, delivers the material swept up in a continuous heap at the side and along the course of the machine. The cost of this machine is 27*l.*

Materials.—The statute width of a highway is 30 feet, of which about 20 is metalled, the chief wear and tear being confined to a space of 12 feet at the crown of the road.

The materials used for repair vary with the locality, and consist principally of limestone, sandstone, gravel, flint, sea-shingle, and the harder rocks.

Limestone is an expensive and bad material for roads. In damp weather in summer it makes a pleasant road for use, but after a continuance of fine weather the stone is converted into dust. In winter, owing to the action of the frost, the stone is soon changed into mud, which has to be scraped off at great and constant expense.

Flint-gravel makes a clean road. If used in sufficient quantities, and properly attended to, it gives a firm surface. If, however, the gravel consists of rounded pebbles, the road never consolidates, but becomes covered with loose round stones, extremely dangerous for horses.

Round gravel is the worst material that can be used for repairs, it always makes a loose, bad road. If the gravel becomes consolidated during the winter, it is certain to work loose again in the following summer. The constant tendency of the stones, as the weight is brought on them, is to roll round one another, and so to work loose.

All material should therefore be angular, and all round stones require to be broken into angular fragments before being placed on the road.

The chief requisites for a road-material are that it should be not only hard but also tough, and that the chemical composition be such that it shall not be affected by the weather; in shape the fragments must be angular, so as to bed well together. Flint is very hard, but it is brittle. Limestone is tough, but when exposed to the weather, soon decomposes. Water-worn pebbles, composed of hard sandstone and older rocks, are both hard, tough, and not easily affected by the atmosphere; but owing to their shape, they never bed together. The only really good road-material which contains all the above qualities is composed of fragments of the granitic and trappean rocks, broken so as to pass through a two-inch gauge. The angular shape of the stones and their uniform size cause them to fit together in a compact body, so that the surface of the road is bonded together like the bricks in a very flat arch, and the fragments are sufficiently tough and solid to bear the weight of the wheel without its being able to break through.

The objections against the use of hard materials are the expense and the difficulty of obtaining them. The latter objection disappears under a consideration of the fact that railways have placed the most distant localities within the reach of all sources of supply; and the former objection is one that will be dissipated on a proper inquiry being made into the question, and certainly can only apply so far as the first outlay is concerned. The superior lasting qualities of the granites (which render much smaller quantities of material necessary), the saving in carting and labour, and the advantage gained in the traction of vehicles from the improved condition of the road, make the use of such materials a real matter of economy; and it is sounder policy to pay the cost of transporting them from long distances than to use the inferior material which may be procured in the immediate locality.

Having carefully examined this question, and observed the operation of roads repaired with different kinds of material during the past 15 years, I am able to give the following figures, taken from carefully kept accounts, which bear out the above statements:—

	Cost per mile. Labour and Material.			Traction lbs.
	£	*s.*	*d.*	
ROAD No. 1.—Repaired with hard gravel picked off the surface of the land, and broken by hand, cost 5*s* 6*d.* per ton, and 2*s.* 6*d.* breaking. Average of four years. 1860-1-2-3	114	0	0	224
The same repaired with granite from Leicestershire, broken into fragments to pass through 2½ inch-gauge, the cost of the granite being 13*s.* 6*d.* per ton on the road. Average of four years, 1864-5-6-7	61	3	0	112
Gain per mile	52	17	0	
ROAD No. 2.—Repaired with broken flint stones, cost 4*s.* 6*d.* per ton, and breaking 2*s.* 6*d.* Average of four years, 1860-1-2-3	137	12	0	
The same, repaired with granite as above, cost 13*s.* 6*d.* per ton on the road..	81	6	0	112
Gain per mile	56	6	0	
ROAD No. 3.—Repaired with flint gravel dug from the land and screened, cost on the road 5*s.* 6*d.* per ton. Average of four years, 1862-3-4-5	65	18	0	280
The same repaired with granite, four years, 1866-7-8-9, cost on the road 13*s.* 6*d.*	46	4	6	
Gain per mile	19	13	6	

The experiments for obtaining the traction were made with one of Howard's dynamometers attached to a waggon with three-inch wheels, loaded with stone, the total weight being 2 tons. The weight given is the number of lbs. required to move this load.

These three roads form the entrance into a provincial town of 20,000 inhabitants, surrounded by a large and very productive agricultural district, with a navigable river, and a railway having communication with all the large centres of industry. The first two examples may be regarded as town roads, but the third is a fair sample of a highway leading to a market town, the expense of material being very heavy, the granite costing about 12*s.* a ton at the railway station, and having to be carted from 2 to 3 miles.

As a further illustration of the economy of using good materials, it may be stated that on a turnpike-road in Lincolnshire, 26 miles in length, the saving effected by the use of granite, instead of gravel, and by proper management, was on an average 276*l.* a year, or about 10*l.* per mile, and the road became so much improved that one horse could more easily draw a cart with a load of 1½ ton than it could before with three-quarters of a ton. This fact was confirmed by the men engaged in carting coals from a railway station to a large village, who assured me that their horses were less distressed on the improved road with the larger load than they were with the smaller one on the bad road.

In one district in Leicestershire the cost of manual labour by the introduction of granite and better management sunk from 1400*l.* to 600*l.* a year, or from 13*l.* per mile where no granite was used, to 6*l.* 10*s.* per mile after its introduction.

The material should be applied in the following manner:—In the summer months it should be led, and deposited along the road in heaps of 1½ ton at regular intervals. As soon as the wet weather in autumn commences, the wheel-tracks and hollow spaces caused by the treading of the horses' feet should be filled in with a shovel from the wheelbarrow, and, as fresh tracks are made, fresh material should be put on, and this be continued up to the end of December or middle of January, practice showing that all fresh material put on after that time works loose in summer-time. A bad gravel road may thus be converted in about three years at a comparatively small expense into a hard, firm road, the quantity of granite averaging for an ordinary highway for the first two or three years about 50 tons per mile, and afterwards about 30 tons a year. A turnpike-road through an ordinary agricultural district will require about 50 tons of granite per mile. By this plan it has been found in practice that 80 tons of granite used on a turnpike, kept the road in better order than 200 tons spread all over the surface; with this additional advantage, that the road was always good for the horses' feet, whereas by the other method the road was almost unfit for traffic until the stone had worked in.

Manual Labour.—From the Parliamentary returns, it appears that the cost of manual labour on the highways and turnpike-roads throughout England and Wales is nearly double that of materials. This must arise from the use of inferior material for surface-repair. However desirable and economical it may be to employ sufficient labour so as always to keep the road in thorough repair, yet by the use of hard material able to bear the wear and tear of traffic, an immense amount of labour is saved, and the road is kept in better order. The use of soft limestone is an instance of the greater proportionate cost of manual labour; the stone put on in early winter has all to be scraped off in the shape of mud before the spring, and labour must be continually employed in breaking stone, laying on fresh coats and scraping them off again. On many gravel-roads, owing to the softness of the foundation, men are continually employed in making the surface of the roads pervious to wet, by raking about the loose material; this looseness allows the first waggon that passes along to leave a distinct track, which every succeeding vehicle follows, until three ruts are worn in the centre of the road; these gradually deepen and form receptacles for holding the water. When these ruts have been worn to the depth of four or five inches, the roadman is sent to rake them in. In some parts of the kingdom this custom has become so prevalent, that the practice is resorted to of raking a small ridge of the loose gravel in the track worn by the horses' feet, which is left standing up so as to drive the horses into a fresh track. The consequence of such a system is, that the surface of the road is always loose and rotten; every shower of rain fills these tracks with water; and the material, be it stone or gravel, is soon worked into mud. A properly kept road ought, both for traction and wear, to have its surface so hard that the wheels of passing waggons shall not be able to make any impression, and the less the surface-materials are disturbed the better for the road. In agricultural districts, where the traffic consists principally of heavily laden carts and waggons, generally going one way and not meeting in sufficient numbers to obliterate the direct track, the tendency, where the country is level, is to keep in one line in the centre of the road, and so to cause ruts, each succeeding vehicle making the track so much more easy to follow and difficult to avoid.

The very hardest paved road will wear away if the whole traffic is kept in one track. What, then, must be the effect on a Macadamised road? A road may be perfectly level, without a rut on it in the morning; but let the time be just after a frost, or in very wet weather, and perhaps a dozen or twenty narrow-wheel waggons, each with loads weighing four or five tons, passing along in the morning; they will all follow one another in a straight line, and leave a sufficient indent behind to show where they have been. Every cart and waggon that follows will take exactly the same track, each cutting deeper and deeper into the road and forming two deep ruts, although the road may be 20 or 30 feet wide; whereas if the drivers had only varied their track a few inches, one set of wheels would have counteracted the effect of those before it, and the road would be left at the end of the day as good as it was in the morning. If this effect is doubted, let notice be taken that wherever there is a turn in the road or an inclination in the surface—however deep the ruts may be on a straight road—they disappear at these points; because at the turning, the horses, when coming from opposite directions, naturally vary their course round the corners, and one wheel-track obliterates the other. Here less material is required than on any other part of the road. As the result of much experience, it may be stated that if the heavy traffic were evenly distributed over our ordinary country roads, they could be maintained at very much less cost than they now are. The object of the roadman should be so to manage his road that ruts are never formed. The surface should be kept level and the traffic evenly distributed over the whole of the road. Constant attention,—continually putting stones on in winter, in small quantities at a time, whenever a rut or depression appears, as shown by the water standing after a shower,—thus causing the traffic to be spread equally over the surface, is the only way to keep at once a good road, and one on which horses can travel with comfort. In summer all loose stones should be picked off. A road which is smothered with loose stones, or which has deep ruts, is both wasteful of expense and bad for traffic.

It may be taken as an axiom that material is always cheaper than labour, and money expended in the former will always prove more economical than that spent on the latter. At the same time, a saving of materials means a saving of money, and by a due attention to manual labour on the roads, material will be saved. By keeping the water off, and the ruts well filled in and levelled, materials are saved and economy effected.

Where roads are not kept level, the practice of letting off the water from the deep ruts is often resorted to after every fall of rain, by dragging with a sharp-pointed hoe an opening in the side of the rut. Wherever this is done a rotten place is made in the road; and wherever one of these grips is made, there is, adjoining it in the rut, a hole into which every wheel jolts down, increasing the draught of the horse and the unevenness of the road.

Highway surveyors and their men are far too apt to keep the surface of the roads too round, under the false impression that the water will get off more quickly. The effect of making a road too convex is to drive all the traffic on the centre, the sides being too steep to allow a vehicle to move there in comfort. In a road that is too convex there is, in addition to the wear and tear from the downward pressure of the wheels, a lateral wear from the tendency of the wheels to slip sideways, and so to be continually grinding away the sides of the ruts and making them wider and deeper. A good road, as already mentioned, should be kept in the form of an ellipse, that is, nearly flat in the middle, with a steeper inclination towards the sides, where should be formed a proper water-table or gutter, with an edge cut in the grass like that of a garden-path, openings being left at intervals to let the water get away to the ditches. Experience shows that a road kept in this form will dry very much more quickly than if kept in the ordinary way; and although it may seem absurd to recommend that a road should have its sides kept as neatly trimmed as those in a gentleman's park, yet in the long run it will be found not only to have a more workmanlike appearance, but also to cost far less than the slovenly plan followed in some places of chipping off the whole of the grass from the sides of the road from the hard material to the ditch, thus removing, as it were, the abutment of the arch of the road, and allowing the material to squeeze out laterally. The sides of the water-table not only act as a support to the road, but also prevent the loose stones from being kicked into the ditches. The water-tables require cleaning out once every year, and this is best done immediately after harvest. The roots of the grass or weeds that may have grown are then destroyed, and have not a chance of growing again before the wet weather of winter. This work can always be let by task-work, a man being able to properly clean out and trim from 12 to 14 chains per day, or where no water-table has been formed before, to set out, form, and trim half that quantity in a day.

A reason for the excessive cost of labour is the employment, in many parishes, of paupers and old men unfit for work, with a view of economising the rates. It will be found on trial that this course is neither efficient nor economical. Nothing requires more judgment on the part of a surveyor than the selection of men for keeping roads in repair. Some men have a special aptitude for the work, and will keep the road in better repair than others who use double the quantity of material. However hard-working and industrious some men may be, they never seem to be able to acquire the necessary skill in properly working a road. It is impossible that any surveyor of roads should always be at hand to direct and superintend his men; they must, therefore, be men that he can place reliance on for keeping their time, and using their judgment as to the use of new material. In the place of that constant supervision, which is generally considered necessary for the direction of workmen, all the surveyor can do is to arrange such a system that he can at once tell whether any of the men employed are not performing their proper share of work. This can only be done by employing a certain number of regular men, and allotting to each man a definite length of road, and placing the same under his care. One man's work can then be compared with others under similar circumstances, and the facts ascertained as to the relative merits of the men. When extra labour is necessary, this arrangement need not be disturbed, but the extra men may be placed under those regularly employed. On an ordinary provincial turnpike-road or leading highway, where good materials are used, an active man ought to be able to keep from three to four miles of road in repair, with occasional help in winter to assist in putting materials on. In summer he will be employed in cleaning out the water-tables, cutting weeds at the side of the road, and cleaning the dirt off the centre.

The average cost of manual labour, materials, carting, and tradesmen's bills for turnpike-roads, which may be taken as the leading thoroughfares throughout England and Wales, is between 40*l.* and 50*l.* per mile, and for the highways, between 11*l.* and 12*l.* per mile. The difference of the two is to be accounted for by the fact that under the highways are included many miles on which the traffic is exceedingly light, and some roads on which there is none except that employed in the tillage of the fields past which they lead. Many of the latter are as yet nothing more than green lanes, receiving no repair except an occasional filling-in of ruts.

The cost of maintaining a road must, in a great measure, depend on its situation with regard to materials—the cost of agricultural labour varying only a few shillings per week throughout England. The cost is necessarily enhanced where materials can only be procured from a distance by an expensive railway-journey; but it must be borne in mind, as already pointed out, that the best materials that can be procured, irrespective of cost, are the most economical. Granite brought from a distance, at a cost of, perhaps, 12*s.* to 15*s.* a-ton, is cheaper than limestone or gravel at one-fourth the cost.

Carting.—Carting used to be invariably performed by what is termed statute-duty, occupiers of land sending one or more teams as required, and being allowed a proportionate reduction from their rate. This practice has now almost ceased to exist, and the surveyor employs such team-work as he requires, paying for the services either by the day or by contract. Taking wages at 2*s.* 6*d.* per day, and allowing 6*s.* per day as an average sum for a horse and cart, with the driver, the carting of materials can be done by contract at the rate of 6*d.* per ton per mile. With higher wages the rate will of course be more, but it may be calculated on this basis.

Carting should always be done in summer, when the roads are hard; and, whenever practicable, the material should be deposited in heaps of one cartload apiece, and then wheeled on to the road with barrows as required. It is bad policy in a surveyor to be carting over his own roads in winter time; and he will then generally have to pay a higher rate for the work, the loose and bad condition of the roads necessitating the carrying of smaller loads. Material, under any circumstances, ought never to be shot directly out of the cart on to the road. Wherever the heap falls the smaller pieces of material and dirt will be left, and the material will thus be unevenly distributed, and the road consequently wear unequally. All stone when first quarried is more or less soft, and hardens by exposure. Stones that have been lying in heaps all the summer will wear longer, therefore, than those which are fresh quarried.

WIDTH OF WHEELS.

A question of great importance as affecting the cost of maintaining roads, is the width of the wheels of the vehicles used in carrying produce and materials. Under the old Highway Act, and under the Turnpike Acts, the weight each vehicle was allowed to carry was regulated by the width of the wheels. No such restriction is imposed under the present Highway Acts; but in any future legislation it should be a matter for consideration whether it is not expedient that such a regulating law should become general, as the effect of heavy loads carried in vehicles with narrow wheels is most detrimental to the roads. A deputation on this subject lately waited on the Home Secretary, and asked for the insertion of a clause in the new Highway Act, by which all carts weighing over 6 cwt. should be restricted to wheels of not less than 4 inches, and all vehicles drawn by more than three horses should have wheels of not less than 6 inches in width.

CONCLUSION.

In conclusion, it may be stated, "That,"—to use the language of the Report of the Select Committee of the House of Commons, in 1819,—"the most improved system is demonstrated to be the most economical; that even the first effectual repair of a bad road may be accomplished with little, if any, increase of expenditure, and that its future preservation in good order will, under judicious management, be attended with considerable saving to the public."

That in the construction of roads care should be taken to provide (1) thorough drainage: (2) a firm and unyielding foundation; and (3) a hard and compact surface capable of bearing the traffic which passes over it without yielding.

That the object in making and maintaining a road should be to diminish the traction to the lowest possible point, and that a horizontal road, without ascents and descents, is most conducive to this end; but as, at a gradient of 1 in 40 a horse may trot down hill with a light vehicle in safety, therefore this may be considered as sufficiently level—more especially as ascending and descending a slight incline gives a certain amount of relief to the horses, and a descent in a road is favourable to wear by more rapidly voiding the water and preventing each vehicle taking the same track. That the transverse section of a road should be as flat as is consistent with drainage; that if the road be too convex it increases the wear, by compelling every vehicle to run in one track on the centre, and also by the disintegration of the road by the lateral thrust of the wheels. That the section should not be the segment of a circle, but that the centre should be laid at less inclination than the two sides.

That the materials used for repairing roads should be hard, tough, non-absorbent of water, and their chemical composition such as not easily to be acted upon by the weather; that the pieces should be angular, and broken in evenly sized fragments of such form as to pass through the same gauge.

That the practice of allowing the traffic to wear down the new material to an even surface—while injurious to both horses and vehicles—also damages the new material by wearing off the sharp edges, and thus rounding the stones, and preventing them ultimately from compactly uniting together.

That rolling with heavy rollers should be resorted to wherever practicable, and great care taken in consolidating the coating of fresh material.

That it is more economical to procure the best material from a distance, than to use that to be found in the neighbourhood if of inferior quality.

That roads should receive constant and unintermitting attention; and that the employment of the labourers should be on a systematic plan by which each man should be made responsible for the care of a certain length of road—by which a spirit of emulation would be created amongst the men, and a check kept, without the necessity of such constant supervision as it is impossible for the surveyor in charge of a long length of roads to bestow.

XV.—*Half-a-dozen English Sewage Farms.*

By John Chalmers Morton.

The agricultural value of town sewage has been frequently discussed in this 'Journal,' and its readers have been kept adequately informed on the subject, as experience and research have from year to year thrown increasing light upon it. In 1862, when a Parliamentary Committee was engaged in its investigation, and enthusiastic men there and elsewhere were urging extravagant estimates on public attention, a lecture by Dr. Voelcker, reported in vol. xxiii., pointed out the fallacy inherent in the merely chemical valuations on which such estimates had been founded, that they took no account of many considerations by which the value of manures is determined, quite as much as by their chemical composition. Professor Hoffman had, indeed, valued ordinary town sewage at 2*d.* per ton, on the same grounds as those by which 11*l.* per ton is justified as the price of Peruvian guano. But upon these same grounds, ordinary farmyard-dung, which could be bought for 3*s.* to 5*s.* per ton, is worth 13*s.* 6*d.*! Cumbered with much material of little value, making the application of the really efficient elements difficult or costly, or unfit except at certain times to certain crops, farmyard-manure is not worth in practice nearly so much as, on a theory omitting such considerations, might be supposed. Sewage in like manner, which, at prices* of 56*l.* per ton for its ammonia, and 31*l.* per ton for its potash, and 7*l.* per ton for its phosphate of lime, might be supposed to be worth so much, may be positively of no value whatever, except in "special cases, such as that of land which has in itself little or no fertilising matter, but is porous." Even thus early, under the guidance of one of the few scientific men who are also practical agriculturists, a sound and sober judgment on this subject was then being given in these pages.

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* These were the prices quoted at the date of Dr Voelcker's paper.

In 1865, again (vol. i., new series), another lecture, delivered in the rooms of the Society, was reported, in which Mr. Lawes, discussing the results of experiments conducted under a Royal Commission at Rugby, warned the authorities of towns that whatever value science may put on sewage, it is the agriculturist who has to decide what its real value is; and this he put as low as ½*d.* per ton when delivered on the land.

In the volume of the 'Journal' for 1867 (vol. iii., new series) there appeared a very complete and candid discussion of the whole subject from the point which a diligent student could at that time attain. Estimates of the value of town sewage are based on the fact that 200 ounces of ammonia per annum pass through the water-closet from every individual of a population. This is equal to one part of ammonia in every 10,000 parts of the ordinary drainage water of our towns, the actual proportion varying with the quantity of the water-supply so much as to make 1000 tons of it worth as much as from 6 to 16 cwts. of guano (or 1*d.* to 2½*d.* per ton). The proportion of its other ingredients (potash and phosphoric acid) corresponds fairly with that of its ammonia or nitrogen to the wants of most of our cultivated plants—that of potash, however, being generally deficient. The experience of those who have tried—every one unsuccessfully—to realise these estimates is also given in the article to which I am referring, which has evidently been written by one who has been able to apply a very sound judgment to the subject, for the general practical conclusions which he deduces from his inquiry are trustworthy still. He says (1) that it is only by a liberal use of water that the refuse-matters of large populations can be removed from their dwellings without nuisance or injury to health; (2) that the discharge of town sewage into rivers is both mischievous and wasteful, and should not be permitted; (3) that the proper mode of both utilising and purifying sewage is to apply it to land; (4) that though for various reasons it is best applicable to grass, it may nevertheless be occasionally applied with advantage to other crops within the area which it commands; (5) that its application to Italian rye-grass, at the rate of about 5000 tons per acre per annum, is probably the most profitable mode of utilisation, but that it is very doubtful whether the farmer can afford to pay ½*d.* per ton for it; (6) that the direct result of the general application of town sewage to grass land will be an enormous increase in the production of milk, cheese, butter, and meat, whilst by the consumption of the grass a large amount of solid manure applicable to arable land and crops in general will be produced; and (7) that except when sewage can be conveyed to a sufficient tract of suitable land by gravitation, towns, so far from making a profit by their sewage, will have to submit to a pecuniary sacrifice in order to secure the necessary sanitary advantages.

Coming now to the year 1871, in the seventh volume (new series) of this 'Journal' an elaborate review and discussion of the whole subject of the agricultural utilisation of town sewage appeared from the pen of Mr. Herbert J. Little. The so-called earth system, and the various precipitation systems of dealing with town sewage, were referred to and condemned. The Reports of the Rivers Pollution Commissioners were quoted in illustration of the inadequacy of these methods of abating the sewage nuisance, and of their utter failure as attempts at realising the value of sewage as manure. The application of sewage directly to the land, as the only available alternative, was described. The soils proper for the purpose, the best mode of preparing them for the application, the kinds of crop to be grown upon them, and the rotation in which they shall follow one another, were discussed. An estimate was drawn up of the probable costs and returns in a hypothetical case. The kind of live stock to be recommended on such a farm was considered. The applicability of sewage to the crops of a market-garden was discussed. Many of Mr. Little's recommendations and conclusions have stood the test of experience since the date of his Paper. Some of them, indeed, date from both writings and experience prior to his Essay, which, however, is still well deserving the study of the sewage engineer and agriculturist. It is the fitness of the crop selected that is the measure of the fertilising effect of the sewage on it. Succulent and rapidly growing green crops are the most appropriate for the sewage farm; and none should be kept longer than it retains the vigour of growth, on which its usefulness as a sewage-consumer depends. Italian rye-grass, the best of them all, should not be kept growing longer than one year. Mangel-wurzels and cabbages were confidently recommended. Grain crops were, with less judgment, but also with less confidence, suggested as a necessary part of profitable sewage management. Mr. Hope's farm below Romford was described as a good example of the management required. The operations here had, indeed, then hardly been completed, and their result was still to be ascertained. Still more directly, because professedly, speculative are the details of the calculation in which Mr. Little indulged in his estimate of the probable expenditure and receipts on a sewage farm of 500 acres, receiving the sewage of a town of 20,000 inhabitants—and yielding a profit of nearly a half-penny per ton!

Since the date of Mr. Little's Paper there has been much costly experience of the subject to which it referred. Sanguine estimates have nowhere been realised; heavy losses have been almost everywhere incurred. The agricultural remedy for the sewage nuisance remains indeed undoubted—but agricultural utilisation has almost everywhere involved an expenditure in excess of the receipts. Instead of indulging in any further estimates in connection with a subject which is at least ten years old, it has now been thought desirable to give a description of some of the more noteworthy examples of the sewage farms which have for several years been in operation, notwithstanding the difficulty of finding any instance of a profitable result; and I have selected Cheltenham, Leamington, Tunbridge Wells, Chorley, Doncaster, and Bedford, as fairly representing the various soils and circumstances under which sewage irrigation has been adopted in various parts of the country. An account of the expenses and returns of these six towns, as regards their sewage farms, may perhaps suggest considerations and conclusions tending to less expensive experience hereafter.

CHELTENHAM.

Cheltenham, a town of 42,000 inhabitants, sends the whole of its drainage-water to a distance of about three miles over a farm of 131 acres on the Lias-clay formation. The houses, some 8000 in number, are generally provided with water-closets, and it may be assumed that the Cheltenham sewage contains nearly the whole of the personal waste of the population. It is conveyed first to tanks, 44 yards long by 10 yards wide, and 8 feet deep, in which, by a certain rough filtration and subsidence, it is separated from its heavier mud; and the remainder flows onwards to the land. The overflow from the tanks is made to drive a turbine, by which the sludge is lifted above the level of the yard close by, where the house-ash, with other town-refuse collected by the scavenger's cart, is placed conveniently to receive it; and the compost is readily bought by farmers and market-gardeners in the neighbourhood for 2*s.* per cubic yard, or 2*s.* 6*d.* when screened. Disregarding the outlay on the original provision of these tanks, which is covered by a farthing rate for thirty years, their annual costs and returns nearly balance one another, as will be seen by the annexed Table (p. 411).

The heavier expenses specified in the first year are explained by the fact that, at first, perchloride of iron was used as a disinfectant. A simple mechanical filtration through a vertical diaphragm in the tank, combined with rest in alternate divisions of it—the overflow of each in turn pumping the mud which has settled in the other—is now the whole of the process to which the sewage is subjected here. From these tanks—situated at the two points to which the whole drainage of the town can most

Year.	Cost and Produce of the Sewage Tanks at Cheltenham.											
	Wages.			Bills.			Total Costs.			Receipts for Manure.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
1870	228	17	5	188	12	9	417	10	2	328	2	6
1871	185	14	5	107	18	7	293	13	0	333	1	0
1872	183	14	0	95	16	3	279	10	3	390	1	0
1873	202	10	6	34	19	2	237	9	8	293	7	4
1874	233	6	9	44	14	5	278	1	2	271	16	0
1875	249	9	3	44	12	7	294	1	10	347	5	0
Total ..	1283	12	4	516	13	9	1800	6	1	1963	12	10

conveniently be brought—an average quantity of sewage, somewhat exceeding 1,000,000 gallons daily, passes through sewers, respectively 18 inches and 15 inches in diameter, to their junction on the farm, at a point commanding the area to be irrigated. From this point the farm—almost wholly permanent pasture-land of fair quality, arranged in eight irregularly shaped fields, which are full of hedgerow timber, and from 6 to 26 acres apiece in extent—127 acres of available surface altogether—slopes in several directions; and the sewage is conducted in the simplest way in open grips or channels, cut contour-wise along the head and occasionally across the middle of the several fields, and feeding furrows along the ridges in which the whole surface of the land has from time immemorial lain. The fields have been drained 3 and 4 feet deep; and, partly in open ditches (reaching them from the surface), but for the most part through these drains, the effluent water finds its way to the lowest part of the farm, and thence into the natural water-course, the Chelt, in which most of the sewage of Cheltenham formerly ran. A portion of the sewage is used on its way to the farm; an increasing number of farm-tenants, whose land lies below the level of the main sewer, being glad to pay the charge of 7*s.* 6*d.* per acre for each irrigation. In this way 180 acres in 1874, and 200 acres in 1875, were fertilised, and contributed to the returns. The annual cost and returns of the farm are given in the Table on the following page.

In addition to the expenses enumerated above, there is the charge for rent. The land was bought for 10,500*l.*, on which 3 per cent., or 315*l.* a year, would probably be a full rent for the 131 acres, and this rent, added to these costs, leaves a considerable margin for farm-profit, which, however, is taken as a contribution towards the burden resting on the town for the repayment of the capital which has been borrowed for the purpose of making the land available. The whole sum borrowed was

Year	Expenses and Returns of the Cheltenham Sewage Farm				
	Labour.	Materials and Bills	Total Cost	Total Receipts *	Receipts from Sewage
1870	168 8 11	133 3 6	301 12 5	372 7 6	
1871	154 10 5	105 0 0	259 10 5	975 2 0	956 8 0
1872	162 2 1	94 1 7	256 3 8	1010 15 10	984 19 10
1873	147 3 0	116 16 7	263 19 7	1068 9 3	952 16 8
1874	162 4 0	104 0 7	266 4 7	935 7 3	910 0 3
1875	153 0 3	243 6 7	396 6 10	1036 6 5	1010 9 5
Total	947 8 8	796 8 10	1743 17 6	5398 8 3	4814 14 2

* The total receipts include some small items for cottage rents upon the farm

18,000*l.*, of which, deducting 10,500*l.* spent in the purchase of land, 7500*l.* was spent upon the sewer and other works connected with the conveyance and distribution of the sewage from the tanks. It will be seen that the returns from the land are not enough to bear the whole of the charges on these accounts as well as the agricultural rental; but the result upon the whole, when compared with the experience of other towns, may well be gratefully accepted by the Cheltenham ratepayers.

Cheltenham is not, indeed, by any means a satisfactory example of sewage utilisation, but it is a remarkable example of the abatement of the sewage nuisance at a minimum of expenditure. Here is a town dependent wholly on its water-closets for what may be called personal and domestic scavenging—whose sewage, therefore, must certainly be of at least the average strength—a town of more than 40,000 inhabitants, of which the drainage-matter may compare for quantity with towns of much larger population in the North, whose house-scavenging depends so much on the cesspool and the cart. It formerly drained into a small stream, which, of course, soon became utterly filthy and offensive; but it has succeeded at hardly any cost in abating the nuisance it had created. In contrast to it I may refer to Blackburn, a town of 80,000 inhabitants, with, however, only 2000 water-closets from which, therefore (though the overflow of its cesspools passes into the sewers), one would think that there can hardly be a much filthier outflow than there is from Cheltenham. Blackburn has spent a ruinous amount in its attempt to achieve the same conclusion. It has spent 40,000*l.* in litigation, Parliamentary costs, and arbitrations alone; and this is the key and clue to its unfortunate experience. In the case of Cheltenham, not a penny has been spent in litigation. The protests of those who were aggrieved were attended to at once; the land was bought at a fair agricultural price; the engineering was done by the town surveyor, whose purpose would naturally be rather to draw as little as possible on the rates than to acquire a name for ambitious or heroic work; the farm was taken as it lay, without attempt at artificial levelling, and the work of irrigation was done, and still, indeed, remains, as an ordinary farmer would do it; its drainage was completed, and its lands and slopes were used, as any ordinary tenant, without capital to waste, would use them. The water, delivered at the highest point, is taken from one field to another in succession at a minimum of cost with a minimum of labour—a couple of men sufficing to shift and regulate the stream, to keep the carriers and surface-conduits good, and to see that every part of the stream is distributed over a sufficient area before it leaves the farm. The inhabitants of the farm locality were provided, before they demanded it, with a supply of pure water from a neighbouring spring, although their stream, always too foul for domestic use, had been improved, not injured, by the proceedings of the Corporation. In this and other ways Cheltenham has been always prompt in providing a remedy, never waiting for costly coercion by the law. On a stiff clay-farm it is not likely that irrigation can be so perfectly successful as it will be where soil and subsoil are more pervious and absorbent; and already preparations are being made for the acquisition of more land, as other sewage-districts pour out their filthy drainage at the Cheltenham outfall. But, at all events, the Chelt has been in the mean time cleansed; the riparian proprietors below are satisfied; and Mr. Humphris, the town surveyor, and Mr. Brydges, the town clerk, and all whose guidance and advice contributed to this satisfactory result, may be heartily congratulated.

Those, however, who are interested in the agricultural utilisation of the immense quantity of fertilising matter which every town dismisses in its sewage, will not so readily welcome the Cheltenham results. The extra produce of the land derived from the application of the enormous quantity of manure which reaches the Cheltenham irrigation-farm through the sewer, is miserably unsatisfactory. The sewage is let run for a day at a time on one portion of a field after another; the town (as landlord) retaining its right to distribute the water as the irrigator on the spot thinks right in order to its proper defæcation; and only one mowing of the grass is permitted in the season, in order to retain this power of irrigation unlimited. Submitting to these conditions, the land is annually tendered for by three or four cowkeepers in the neighbourhood, at prices varying from 6*l.* to 9*l.* per acre (for the next three years it has now been let for the sum of 800*l.* per annum); and, including the receipts for sewage applied to neighbouring land, which, however, are annually increasing, the produce of the land beyond the sum which it would yield under ordinary management can hardly be estimated at more than 300*l.* a-year, or not much more than 1½*d.* per head per annum of the population concerned!

LEAMINGTON.

Let us now take the case of another town, resembling Cheltenham in its reputation as a watering-place, and naturally jealous, therefore, for its health and the wholesomeness of its surroundings. Leamington, with a population of 22,000, now delivers its sewage by pumping, to a point at a distance of nearly two miles from the town, and 130 feet above its outfall, where it commands 1000 acres of Lord Warwick's land. This it does for an annual payment of 450*l.* a-year, thus getting nearly 4½*d.* a-head per annum for the personal waste of its inhabitants; a sum which, though three times as good a result as Cheltenham realises, does not, of course, nearly repay the large expenditure which the town has incurred in this and previous attempts at dealing with its sewage difficulty. Neither, indeed, am I yet able to say that the land to which the sewage has been thus applied is not over-rented with this charge of 450*l.* upon it in addition to its ordinary agricultural rent. The works cost, altogether, over 24,000*l.*, including 8500*l.* for works formerly used for the lime-process of defæcation, and the "A B C," or Native Guano Company's system of precipitation. The annual instalment, for the interest on this outlay and the repayment of the principal expended in thirty years, amounts to 1563*l.* 15*s.* The working-expenses last year amounted to more than 1000*l.*, less 450*l.* received from Lord Warwick for the sewage, leaving a net cost of close on 600*l.* Deducting the proportion chargeable on neighbouring townships which contribute, the net annual cost to the borough of Leamington for disposing of the sewage of the town, and repaying the cost of the necessary works within a period of thirty years, is about 1800*l.* The land has been wholly drained 4 and 5 feet, and from 8 to 15 yards apart, to outfalls from which alone is there any effluent water from the farm. I have been at these outfalls very often, and have never seen anything but bright clear water issuing, so that the agricultural remedy for the sewage nuisance is here perfectly successful. The sewage is conveyed to every field upon the farm by carriers connecting with the principal main on its way to the summit level (where a reservoir capable of holding 1,000,000 gallons has been provided, and has been occasionally used). The sewage thus passes either through the several fields, or along the upper edge of each, in 9-inch socketed earthenware pipes, which are provided with frequent sluice and penstock arrangements—so that the contents of the pipe, stopped in their flow, can be delivered at a number of points in every field into contour carriers, made by plough and spade. From these carriers, lipping over the edge of each along a certain length of its course to which it is limited by the irrigator, the sewage flows down the sloping surface to the similar carrier below, sinking gradually meanwhile to the subsoil drain. The annual charge created by the cost of these irrigation works, including carriers, sometimes embanked, and sometimes lifted upon timber framing, so as to command the higher levels, is, of course, a considerable addition to the 450*l.* of annual sewage-rent; and adding to these items the amount of an ordinary agricultural rent of the land, Lord Warwick's Heathcote Farm of 375 acres has to pay a large annual rent before, as tenant, his Lordship can claim any balance of receipts over expenditure as the return of the farming-capital which he has here employed. There may, indeed, be deducted from the sewage-rental paid to Leamington some receipts for sewage sold to neighbouring farmers. Thus, of the 1,452,927 tons actually delivered from the Leamington pumping-station in 1875, there were no less than 205,628 tons delivered on neighbouring lands, where, distributed by a rough system of furrows ploughed out of the surface, it so far increases the yield of grass that the tenant readily pays 20*s.* to 30*s.* an acre for it. The receipts from this source amounted to 46*l.* last year; and we ought, on this account, to reduce the sewage-rent of 450*l.* a-year to 400*l.*; but there is still a heavy annual charge upon the land, in addition to the agricultural rent of 44*s.* per acre which the farm has to bear, and which, by its increased fertility, it must more than yield before it can be declared an agricultural success. Whether or not Lord Warwick has realised from the Heathcote Farm a return in accordance with this additional rent, corresponding with what might have been obtained from the farm well-managed and equipped in ordinary agriculture, paying an ordinary agricultural rent, I am unable to say; but any one who spends a day upon the farm, as I have often done, can see that in the hands of Mr. David Tough, and under the general direction of Captain Fosbery, Lord Warwick's agent, it is admirably productive—full of produce, and apparently full of profit.

There were on Heathcote Farm last September, when I last visited it, 40 cows in-milk or in-calf, 7 in-calf heifers, 24 heifers and bullocks rising 3 years old, 35 yearlings, and 25 calves. There were 4 sows and their produce in the yard; and there was a flock of 180 ewes, and upwards of 200 lambs—their produce—which are sold annually fat as shearlings. Thirteen cart-horses work on the farm, and 3 at the Park; for, in addition to the 375 acres at Heathcote, there are 50 acres of plough-land and 200 acres of pasture-land at the Park under Mr. Tough's management, for the pasturage of which, however, cattle are purchased and provided, in addition to the stock enumerated. The above large stock was kept on the produce of the Heathcote Farm alone. The cropping of the land during the past six years is given in the Table opposite.

The quantity of sewage pumped daily over these fields varies from 800,000 to 1,000,000 gallons. The whole house-waste of the town comes to the outfall, where there is sufficient reservoir accommodation to render it generally unnecessary to pump on Sundays. During flood-time, of course, the reservoirs are full, and the overflow runs to the Leam; but in dry weather three hours' pumping suffices to empty them. Four men are daily engaged in distributing the sewage, generally at as many different points upon the farm, according to the needs of the crop, or of the land, or the power of the soil on different fields to deal with it at such times as it is not wanted for the promotion of current growth. These four men are, however, available for other work during a great part of their time. During spring and summer they are employed in cutting grass for purchasers, who bring their carts for its removal, paying from 8*d.* to 1*s.* a rod for the grass as it is cut. They receive 17*s.* a week, besides 1*s.* an acre for the grass they cut, and can generally make about 21*s.* a week during the year. The water is in autumn and winter roughly directed by plough- and spade-made furrows over the stubbles and the fallows intended for next year's beans, oats, barley, and mangel-wurzel. In spring and summer the Italian rye-grass takes the most of it, but mangels, cabbages, and various garden crops are watered as they want it; and the neighbouring grass-fields receive it when the tenants apply for it. The quantity applied, and the number of dressings given during 1876, will be gathered from the Table on page 418.

A record of this kind has been kept ever since the work began in 1871; 927,961 tons were distributed in 1872; 1,291,442 tons in 1873; 1,318,619 tons in 1874; and 1,451,930 tons in 1875; and out of this the sewage supplied to farmers outside has varied from 104,000 to 205,000 tons per annum.

The resultant produce on the Heathcote Farm is very remarkable. Referring only to the 54 acres of Italian rye-grass, partly one and partly two years old, to which, with about 12 acres not cropped that year, no less than 900,000 tons were applied in 1875, the accounts for that year show that more than 800*l.* was received for grass sold from that area, besides the daily provision of green food for 30 to 40 cows and 16 horses during the

CROPPING of the different FIELDS of the HEATHCOTE FARM.

Number of Field on Plan.	Acreage.			1871.	1872.	1873.
	A.	R.	P.			
13	12	2	6	..	Beans	Wheat.
20 and 21	6	1	25	Potatoes	Cabbage	Barley.
22	7	3	6	Wheat	Market Garden	Cabbage.
23 and 29	15	2	16	Wheat and Oats	Potatoes and Mangel	Wheat.
24	5	1	12	Wheat	Peas	Cabbage.
25	10	1	17	Barley	I. Rye-grass	I. Rye-grass.
27 and 28	13	3	2	Peas	I. Rye-grass	I. Rye-grass.
26 and 30	6	2	24	Permanent Pasture	Permanent Pasture	Permanent Pasture.
41, 45, and 46	19	1	18	Permanent Pasture	Permanent Pasture	Permanent Pasture.
42	8	3	0	Wheat	Mangel	Wheat.
43	9	0	4	Swedes	Barley	I. Rye-grass.
44	6	3	17	Wheat	Mangel	I. Rye grass & Clover.
47	10	0	32	Barley	Oats	Clover.
48	11	0	36	Swedes	Wheat	Grass.
50, 63, 67, 68	39	3	25	Permanent Pasture	Permanent Pasture	Permanent Pasture.
51, 53, and 60	28	2	21	Wheat and Barley.	Mangel and Swedes	Wheat.
52	8	1	24	Permanent Pasture	Permanent Pasture	Permanent Pasture.
54	9	1	29	Wheat	Beans	Wheat.
49, 55, and 56	23	2	8	Wheat	Beans	Wheat.
57	20	2	3	Permanent Pasture and Mangel	Wheat	Beans.
58 and 59	20	0	15	Swedes and Peas	Wheat	Mangel.
61	12	1	3	Barley	Swedes	Wheat.
62	5	1	30	Wheat	Clover	Wheat.
64	10	1	34	I. Rye-grass	I. Rye-grass	Wheat.
65	10	3	11	I. Rye-grass	I. Rye-grass	Wheat.
66	10	2	25	Oats	Beans	Mangel.
69	9	2	3	..	Beans	Fallow.
71	7	2	36	..	Wheat	Peas.
72	9	1	36	..	Wheat	Swedes.

Number of Field on Plan.	Acreage.			1874.	1875.	1876.
	A.	R.	P.			
13	12	2	6	I. Rye-grass	Turnip	Beans and Grass.
20 and 21	6	1	25	I. Rye-grass	I. Rye-grass	Mangel.
22	7	3	6	Turnips.	I. Rye-grass	I. Rye-grass.
23 and 29	15	2	16	Barley	Winter Beans	Wheat.
24	5	1	12	Barley	I. Rye-grass	I. Rye-grass.
25	10	1	17	Grass	Cabbage	Cabbage and Turnips
27 and 28	13	3	2	Cabbage and Wheat	I. Rye-grass	I. Rye-grass.
26 and 30	6	2	24	Permanent Pasture	Permanent Pasture	Permanent Pasture.
41, 45, and 46	19	1	18	Permanent Pasture	Permanent Pasture	Permanent Pasture.
42	8	8	0	I. Rye-grass	Mangel and Carrots	Barley.
43	9	0	4	I. Rye-grass	Mangel	Potatoes, Carrots, &c.
44	6	3	17	Winter Beans	Wheat	I. Rye-grass.
47	10	0	32	Wheat	I. Rye-grass	I. Rye-grass.
48	11	0	36	Grass	Winter Beans	Wheat.
50, 63, 67, 68	39	3	25	Permanent Pasture	Permanent Pasture	Permanent Pasture.
51, 53, and 60	28	2	21	Spring Beans	Wheat	Oats and Swedes.
52	8	1	24	Permanent Pasture	Permanent Pasture	Permanent Pasture.
54	9	1	29	I. Rye-grass	I. Rye-grass	Winter Beans.
49, 55, and 56	23	2	8	Oats	Mangel and Swedes	Oats.
57	23	2	3	Wheat	Oats	Spring Beans.
58 and 59	20	0	15	Wheat	Beans	Wheat.
61	12	1	3	Clover	Clover	Clover.
62	5	1	30	Barley	Potatoes	Barley.
64	10	1	34	Parsnips, Potatoes, Carrots	Rhubarb, Mangel, Cabbage	Rhubarb, Grass, &c.
65	10	3	11	Mangel	Wheat	Mangel.
66	10	2	25	Mangel	Oats	Clover.
69	9	2	3	Wheat	Barley	Swedes.
71	7	2	36	Wheat	Barley	Beans.
72	9	1	36	Barley	Clover	Wheat.

AMOUNT of SEWAGE applied to different FIELDS from January 1, 1875, to January 1, 1876, on the EARL of WARWICK'S SEWAGE FARM.

Number of Field on Plan	Number of Acres			Crop	Number of Dressings	Total Amount of Sewage	
	A.	R.	P.			Tons	
13	8	2	6	I. Rye-grass ..	18	58,314	Light Loam, with Gravel Subsoil.
..	4	0	0	Cabbage ..	17	32,186	Do.
20, 21, and 22	14	0	31	I. Rye-grass ..	35	181,322	Do.
24	5	1	12	I. Rye-grass ..	49	146,676	Do.
25	10	1	7	Cabbage	14	35,114	Do.
27 and 28	13	3	2	I. Rye-grass ..	42	279,010	
49, 55, and 56	5	0	0	Mangel	4	7,352	
47	10	0	32	I. Rye-grass ..	36	166,470	
54	9	1	29	I. Rye-grass ..	25	98,735	Loam, with Clay Subsoil.
64	8	1	34	Cabbage, Rhubarb, and Strawberries	4	15,910	
65	10	3	11	Fallow for Mangel ..	2	9,176	
72	9	1	36	Clover . ..	3	13,886	Do.
41, 45, 46, 50, and 67	37	0	18	Permanent Pasture	7	66,635	Do.
42 and 13	14	0	4	Fallow for Mangel ..	23	135,515	
Sewage supplied to Farmers						205,629	
Total Amount of Sewage for twelve months ..						1,451,930	

whole of the spring and summer. I can vouch from actual inspection for the admirable grain crops and the magnificent mangel-wurzel crops which the farm yielded in 1874, and which it promised in 1875 at the time I was over it. A mangel crop in two large fields which I saw in 1874 was stated to me to have yielded rather more than 10 cwt. per rod in several places where the weight had been taken; and the extremely even character and large size of the roots, with the enormous earthworks, as they seemed to be, in which the crop was stored all round the fields, made the story perfectly credible. The soil of these fields is not of first-rate quality—a rather gravelly loam—and it had received no manure for several years previously; and the crop, happily circumstanced as regards both its seed-time and the subsequent summer, had followed upon dressings of sewage alone.

Heathcote Farm varies from a tolerably firm gravelly soil to a clay loam—the whole rather of second quality as regards natural fertility. Nowhere absolutely flat, and sloping in many directions, it is very well adapted for the catchwater system, which, like every other mode of irrigation, but in a more marked degree, permits the use of the water of irrigation over more than one area before it finally sinks into the subsoil. The sewage is made to traverse 5 to 8 acres every day, according to the quantity that comes and the nature of the soil to which it is being applied. The men employed in distributing it—engaged in the cow-house and at other work till breakfast time, after which the process begins, and generally at liberty again after dinner time, when the pumping ceases—not only open stops and regulate the flow during the 4 or 5 hours when the pumping generally is going on, but attend to the maintenance of the carriers, and to the correction of any faults in the open furrows by which the sewage is distributed on the surface of each field over which the process is gradually encroaching. Every freshly cut area of Italian rye-grass receives a dressing soon after the grass has been carried off, and again midway of its growth before it is ready to be cut again. The mangels are watered as soon as the plants are as large as lettuces, and again two or three times during dry weather until of full growth —the intervals being long enough to enable the thorough drying and the horse- and hand-hoeing of the land at proper times. The quantity applied runs down the furrows between the rows of plants, being stopped and sent sideways as required, so that every square yard shall receive its share. And during winter the land intended for mangels and for spring-sown corn-crops receives its daily share in turn—the freer and more pervious soils getting the largest quantity.

A capital herd of good dairy Shorthorns has at length been got together, a well-bred Shorthorn bull being employed; the steers as well as the heifers are kept on until ready for sale as in-calf cows or fat cattle. The cows receive 1½ cwt. of grass apiece daily in their stalls during summer; getting mangels with some hay, and a gallon of bean-meal apiece daily so long as they are in-milk, during winter. They yield nearly 600 gallons of milk apiece per annum, and it is sold at the farm for 11*d.* a gallon. An annual receipt of 900*l.* to 1000*l.* is thus calculated on for milk. Some 200*l.* is annually received for mangels sold, 800*l.* for grass, and 1500*l.* for grain and other green crops. And this, with considerable receipts for beef and mutton, wool, and pork, results in a large annual produce, from which the deduction for labour, seed, bought food, and rent, leaves a balance which is year by year becoming more satisfactory; the large outlay of the landowner in the engineering expenses of equipping the farm for the reception and distribution of the sewage being at length gradually overtaken.

A beginning has been made at market-gardening. Rhubarb. broccoli, and strawberries are being cultivated with the aid of sewage. The area of the several crops and the order of their succession on the land—the crops to which the sewage has been applied and the number of dressings given, are severally stated in the Tables given above, which, together, give a general and tolerably complete picture of the farm and its management perfectly intelligible to an agricultural reader. It is only necessary to add that the stock is well housed and evidently in comfortable and prosperous circumstances; that the land is clean, and the labourers well in hand and apparently contented; and it is plain that Heathcote Farm is in good practical hands, and that the real agricultural value of town sewage as a fertiliser will one day be perfectly illustrated here.

CHORLEY.

Chorley, a Lancashire town of about 18,000 inhabitants, obedient to an injunction restraining the sanitary authority from continuing a nuisance in the River Chor, took in 1868, on a lease for 21 years, the Common Bank Farm, containing 87 acres, for the purpose of sewage utilisation. And in 1871, an Improvement Act having been obtained, at a cost of 1924*l.*, by the Chorley Commissioners, giving power to acquire land compulsorily for, among other purposes, sewage utilisation, this farm was purchased on its sale by auction. The Common Bank Farm, now nearly 100 acres, lying below the level of the sewer outfall, was purchased under this Act at a cost of 6995*l.* 12*s.* 8*d.*, to which must be added 3994*l.* 13*s.* 7*d.*, the expense of preparing the land, including sewage-carriers, machinery, additional farm-buildings, roads, farm implements, and stock. The annual charge created by this outlay, which is taken as rent, amounts to nearly 600*l.* per annum—an annuity which at the end of 70 years will discharge the original loan, when the farm will become rent free, the property of the Corporation. The annual farm receipts and expenses during the first five years appear in the following Table:

ANNUAL FARM BALANCES,* 1871–1876.

	1871.	1872.	1873.	1874.	1875.	1876.
	£	£	£	£	£	£
Annual expenses ..	971	1000	879	1204	926	894
Annual returns ..	738	654	557	979	847	975
Annual loss	£179	317	322	229	79	Profit 81

* The accounts are made up to the end of May in each year.

This, it must be understood, is a balance of accounts exclusive of rent and interest on capital; and although the loss has been annually diminishing for some years, it is plain that these returns show a very unsatisfactory result. The average delivery of water into Chorley for the entire population is about 500,000 gallons daily. Only a portion, however, finds its way into the town sewer. The quantity of sewage delivered on the farm, including the rain-water, subsoil, drainage, &c., varies from 200 to 3000 gallons per minute. The average dry weather discharge is 500 gallons per minute, or 360,000 gallons during the day of 12 hours. Considering the enormous quantity of the sewage, and the fact that there is a large quantity of house scavenging done in Chorley on what is called the tub system—that indeed there are not more than 200 water-closets connected with the sewers—it is plain that the Chorley sewage, however filthy and offensive it may be, must be much weaker than that of either Leamington or Cheltenham. To that, as well as to the wetter and colder climate of the locality, may be in part attributed the unsatisfactory result of sewage irrigation in this case.

The water is delivered through a 15-inch sewer, with a fall of 1 in 70, to the farm, about 1 mile from the town, and it is there taken in embanked carriers above the surface of the land, whence it commands an area of about 80 acres of a rather stiff loam, with natural slopes sufficient for its perfect distribution. The land is well drained with 2-inch pipes, 4 feet deep, at intervals of six yards; and being an upland as compared with the bed of the rivers Chor and Yarrow, which run in deep ravines on either side of it, the drainage water is collected again for a last use upon a river-side alluvial level of about 4 acres of permanent pasture-land. The whole estate is 98 acres in extent, of which 11 acres are occupied by woodlands on the steep slopes which cut off the farm from the two streams.

The farm was laid out for the reception of the sewage by the Town Surveyor, Mr. James Denham, in lands 20 yards wide, and there are carriers made by plough and spade along the ridges. The sewage is delivered into three or four of these furrows at a time by sluices in the main conduit, which runs for the most part 3 or 4 feet above the general level. It thus passes over 5 or 6 acres during the day, the stream being regulated by the irrigator, who works a set of stops in the surface furrows, and helps the flow in uneven places with the spade.

Considering the limited area at disposal, and the quantity of water to be dealt with, the land did not seem to me last year to be very wisely cropped. No less that 32 acres were in oats and this had the effect of concentrating the application of the sewage upon too small a remainder. The oats were a very heavy and strawy crop, much beaten about by the weather. About 20 acres were in clover, and this, too, is a crop which does not readily lend itself to the work of the irrigator. Ten acres were in swedes, giving a splendid promise in August; but swedes, too, I have not found a very suitable crop for sewage husbandry. Only 20 acres were in Italian rye-grass, of which a portion was being cut a fifth time that season; and a large area was covered with grass in swathe or cock, in an attempt to make hay—an attempt generally very unpromising, and always undesirable on sewage-farms. And there was a considerable area in fallow, in very rough plight indeed. At the old farm-buildings and in the lower grass-field, to which access is obtained by a good road across the farm, enabling the conveyance of the crops both thither and from the farm, I saw a herd of 11 good milking cows, a number of calves, and three good horses. In addition to these, sheep are bought in autumn for the consumption of the turnips, clover, &c. The sales of the farm include milk, clover, and rye-grass hay, a certain quantity of mutton and pork, generally a large crop of oats, and a good deal of straw. And in addition to all this there is a considerable receipt for Italian rye-grass, sold as dear as 20*s.* a ton in early spring, and from 10*s.* to 12*s.* a ton during summer. The whole receipts have varied from 600*l.* to 980*l.* a year, or from 7*l.* to 12*l.* an acre, not nearly so much beyond the mere grass-lettings of the larger Cheltenham farm as to recoup the enormously greater annual expenditure in its production. Italian rye-grass is kept down generally two years, and is sown at the rate of as much as 5 bushels an acre, in sowings crossing one another on a well-worked oat-stubble in early autumn.

The mode of cropping the Chorley farm is, I think, considering its small extent, mistaken. The whole land should be made available for irrigation, instead of the small portion to which the application of the sewage is at present limited. Instead of oats and swedes and clover, which are rarely sewaged, except, indeed, in the fallow condition of the land before the seed is sown, the whole should be devoted to such succulent crops as are especially adapted to sewage treatment. Italian rye-grass should be more extensively cultivated, and cabbages, and perhaps mangel-wurzel, might be grown on part of the land—though whether the climate would be perfectly suitable for the last-named crop is questionable. And if a market for these crops cannot be obtained in the neighbouring towns, a larger quantity of stock should be reared and fed upon the farm, either store-stock or milch-cows, increasing the number of them as a market can be obtained for their produce.

DONCASTER.

Doncaster, a town now probably of 20,000 inhabitants (it numbered 18,768 at the last census) pumps its sewage, 20,000 tons a week, = 600,000 gallons daily, to a height of 52 feet and a distance of 2 miles, on to a farm of 263 acres, its own property, which it has taken in hand for sewage-irrigation, and since sublet to a tenant. The land is for the most part a free and easily worked soil of sufficient depth. The sewage is delivered at its highest point, where an open reservoir has been provided capable of holding 1,000,000 gallons, and thence it can be distributed over the whole of the area, which lies a rolling surface below it, partly, indeed, in successive ridges of hill and valley, almost as if intended for the purpose to which it is now devoted. The sewage from the summit-level is conveyed along these natural ridges, and to various positions in all the fields, from which it can be diverted into this, that, and the other contour-carrier made by plough and spade on the surface of the land. From these, confined by the irrigator to successive lengths of each, until the whole of the surface immediately below it has been thoroughly swilled, it distributes itself over the interval between it and the carrier below it. The land has been laid out by Mr. B. S. Brundell, C.E., of Doncaster; and his brother, Mr. Richard S. Brundell, has become the tenant of the land, and is now responsible for the abatement of the sewage-nuisance. Five acres of a level field are laid out on the highest part of the farm—a very pervious soil and subsoil close by the reservoir—for the adoption of intensive intermittent filtration. This is drained six feet deep at intervals of 22 yards, and is provided with suitable surface-carriers 22 yards apart; so that, if necessary, the water may be poured on here exclusively on one quarter of the area for six hours at a time, and thus allowed to escape through the drains after being perfectly oxidised and rendered non-putrescible in its passage through the aërated subsoil. Notwithstanding, however, that the farm is only getting into condition for its purpose, so that its power of receiving sewage for agricultural use may be considered not yet fully developed, it is somewhat instructive and significant to learn that there has not yet been any difficulty in finding an area on the farm fitted for the daily reception of the sewage where it might be turned to agricultural account, as well as subjected to that same process of intermittent filtration in the less intensive form which it experiences in ordinary irrigation. In fact, neither the reservoir nor so-called filter-bed has yet been put to its intended use.

The land last summer (1875), when I was over it, was, excepting an unusual extent of Italian rye-grass, occupied in very much of an ordinary style of cropping. Out of 263 acres, 56 acres were taken up with wheat, 36 acres with barley, 7 acres with oats, and 13 acres with beans; 114 acres were taken up with green crop—Italian rye-grass (42 acres), clover (7), swedes (24), mangolds (35), and potatoes (6). There were also 7 acres in bare fallow, 6 in garden-ground, and 24 in permanent pasture. Potatoes were looking very promising, exceedingly full of growth, with, however, some indication of disease; mangel-wurzels were looking very well. They had all received occasional dressings of sewage during their growth. The grain crops were admirable; and the Italian rye-grass, most of it in full growth, was being sold at the rate of about 30 tons a week, at prices which had varied from as much as 30*s.* a ton down to 15*s.* Probably the speciality of the Doncaster sewage-farm is its garden-ground, which, lying admirably for the reception of sewage, will no doubt ultimately be enormously productive. Besides ordinary garden vegetables, there were beds of fruit—strawberries, gooseberries, and currants; all of which had been sewaged, and owed their productiveness in some measure, so it was believed, to the occasional irrigation which they had received.

The stock upon the farm included 8 cows in-milk, upwards of 30 head of various ages; and a flock of 80 ewes, whose lambs had been sold fat. A rental of 800*l.* is paid for the farm, the cost of pumping, 300*l.*, being included with the sewage in this gross rental. The annual labour-bill approaches 1000*l.*, and the returns must thus exceed 1800*l.* a year before the tenant begins to receive a return for his capital and skill. This sum, over 250 acres, amounting to 7*l.* an acre, will certainly be without much difficulty realised; and Mr. Brundell having so large an area at his command is wise in only gradually stepping out of the regular agricultural routine; from which, however, he will, no doubt, more and more diverge into the cultivation of succulent and market-garden crops in preference to ordinary grain crops, as he obtains an increasing market for his produce.

The farm is well equipped with buildings; and it may easily in a few years become one of our best examples of good sewage cultivation.

TUNBRIDGE WELLS.

Tunbridge Wells is a town of nearly the same population as Doncaster—19,410 at the last census. Having been restrained some ten years ago by an injunction—obtained at the instance of Mr. Julian Goldsmidt, who owns property in the northern valley below it—from throwing its filthy drainage-water into the Calverley Brook, which runs down that valley, it has had to adopt sewage-irrigation as a remedy. Situated at the head of valleys running from it in two directions, it has taken two small farms for this purpose; one in the northern valley, of about 120 acres, of a stiff soil, at a distance of 1½ mile from the town, and one of 165 acres in the southern valley, a lighter loam—in some places, indeed, a poor moory sand—at a distance of about 3 miles. An expenditure of no less than 87,243*l.*, or nearly 300*l.* an acre, has been thus incurred for engineering, land, and law expenses—an outlay which involves an annual charge for its liquidation of more than 5 per cent. upon this sum, or over 13*l.* an acre—making irrigation in this case, however perfect it may be as an abatement of the sewage nuisance, altogether hopeless as a commercial speculation. The farms are both provided with tanks at the outfalls of the main sewers, in which the sewage is allowed to deposit its heavier mud, which is removed at intervals either to the field close by, or to land in the neighbourhood. The mud from the tanks at the head of the northern farm is purchased by a neighbouring farmer for 35*l.* a-year. The quantity of the sewage delivered on these two farms, including the water supply of 200,000 to 400,000 gallons daily, and the ordinary subsoil drainage of the town site was, when last gauged, 236,000 gallons daily on the northern farm, and 414,000 gallons daily on the southern farm. Besides this, however, there is an indefinite and uncertain quantity of rain-water and storm-water—sometimes suddenly more than doubling the quantity of sewage to be dealt with, and putting the farm-manager and his irrigators in difficulties. When I was at Tunbridge Wells last May, a heavy rainfall over the town, which was hardly felt at the farm, suddenly flooded all the carriers, rushed over sluices, found its way—laden with road-mud and silt—over the good old pasture-land, and put every one on the alert to open a passage for it at as many points upon the farm at once as possible.

From the tanks on both farms, substantial brick-built carriers, with carefully-levelled margins, contour the sides of the valley at as high a level as they can command; and from one side of the valley, through syphon-piping of sufficient size, the sewage is conveyed to a corresponding brick-built carrier on the other. In addition to this, on the northern farm, the upper conduit is connected by a corresponding carrier, having frequent sluice-arrangements on its course down the hill, with a second and a third brick-built contour carrier of smaller section at successive levels below it. Delivered at frequent openings in these conduits, the sewage finds its way to one contoured surface-furrow after another, generally at intervals of 18 or 20 yards, or less where the slope is steeper, and is spread evenly over the intervening surface, gradually sinking into the drains as it goes. So much of it as has not thus sunk away may in this way be picked up for re-use at least three times between the first and second bricked conduits, three or four times between the second and third, and ten or eleven times below the third, before it reaches the foot of the farm. The water is not, however, sent out thus over the whole slope from top to bottom, but is taken from one part of the farm to another, according to the requirements of the growing crop. Thus it may be employed first in watering an area from which Italian rye-grass has just been cut, immediately below the head-level conduit. The tail-water from this surface may then be conveyed straight down the hill, through the syphon-pipe, across the valley, and re-appear upon a corresponding area of recently mown Italian rye-grass midway of the slope upon the opposite side. This was, indeed, the actual arrangement on the day of my visit last May; and I learned that the subsoil-water from the drains underneath the first-named sewage plot was also at the same time collected and sent across the valley for re-use with the tail-water of the surface. The cropping this summer has included 35 acres of grain crops—8 of beans, 2 of barley, 16 of wheat, and 9 of oats; 10 acres of mangels and swedes; 30 acres of Italian rye-grass, of which 12 had been sown in the autumn of 1874 and have now been ploughed up; 12 had been sown in the autumn of 1875, and 5 or 6 had been sown this spring. There are also 11 acres of clover, 1 acre of cabbage, and 25 of old grass-land. Mr. Robert Fairbairn, who has been in charge of the farm since 1869, when it was laid out by the late Mr. J. Lawson, C.E., sells large quantities of Italian rye-grass to the horse- and cow-keepers of Tunbridge Wells, who come one or two miles with their carts and waggons for it, and pay from 15*d.* a rod for it on the ground. That was the price received in May for a magnificent swathe of grass sown in the autumn of 1875, which was then being cut, and the demand seemed likely to overtake the growth of the crop, rapid as that had been. During the time of this great demand for grass, the 25-acre field of permanent pasture, which is also irrigated as it seems to need it, maintains the large herd of cattle kept to consume the Italian rye-grass during the period of smaller demand.

The drainage—ordinary agricultural drainage—which is being continually corrected and improved, is not even yet perfectly satisfactory. The minor drains vary from 3 to 4 feet deep, and 2 to 3 rods apart, and the main drains deliver their water into the sewage-carriers again; and thus nothing leaves the farm without having had several opportunities of feeding growing plants, or of being itself thoroughly oxidised and defæcated.

The following Table represents the balances of the several annual accounts since 1871.

Year.	Cost and Returns for Northern Sewage Farm								
	Valuation and Expenditure.			Receipts and Valuation			Profit		
	£	s	d.	£	s.	d.	£	s.	d.
1870-1	2468	0	4	2881	13	5	413	13	1
1871-2	2777	6	7	3004	18	4	227	11	9
1872-3	2628	14	0	2882	3	8	253	9	8
1873-4	2790	14	2	2900	10	4	109	16	2
1874-5	2658	19	4	2982	0	11	323	1	7
1875-6	2464	7	9	2936	7	3	471	19	6
Total .	15788	2	2	17587	13	11	1799	11	9

The last column is not properly designated profit, for it only tells you the amount by which the receipts have exceeded the expenses of labour and seed. The enormous rental of 13*l.* and more per acre, which the farm has to bear, owing to the outlay which has been incurred, is not included.

Reverting now to some of the details of farm management, Mr. Fairbairn prefers the early autumn as the best seed-time of Italian rye-grass. He sows, not later than September, 3 bushels per acre, in two sowings crossing one another, upon a pea- or bean-, or early oat-stubble—worked as thoroughly as possible—and the first cutting of such a sowing, which I saw last May, certainly could not have been less than 16 tons per acre, leaving as perfectly thick and strong a stubble of rye-grass root as I have ever seen, for the four or five subsequent cuttings which it will yield this year, and the three or four less satisfactory cuttings which it will yield next year, before it is ploughed up and well-fallowed for the wheat and bean crop to succeed it. In no case has ordinary farm-manure been applied to these or any other crops on this farm. The large quantity of dung made in the stalls has all been sold to neighbouring farmers, and the crops have depended on sewage-manure alone. The heavy crop of grass to which I have referred was grown on land—a stiff and inferior soil—which had received no other manure than sewage since 1869. It is questionable if this be good policy. The land is not naturally fertile, and after a winter's watering it ploughs up stiff and unkindly, and it is very difficult to get a tilth in which mangel-wurzel seed will sprout. Nevertheless, heavy crops of mangel are grown, and 3 acres last year yielded a revenue of 108*l.* for mangel sold, besides a considerable quantity of roots consumed at home by cattle. If this land were dressed with farmyard-manure at intervals, as well as sewaged, it would become lighter and more friable, more easily cultivated, and more capable both of defæcating the sewage as it passes over it, through it, and amongst it, and, at the same time more capable of doing justice to its fertilising powers. The kind of rotation adopted by Mr. Fairbairn may be gathered from the cropping of one of the fields, which in 1872 and 1873 was in Italian rye-grass. Ploughed up in the autumn of 1873, it was sown partly with oats and partly with barley in 1874, and after being fallowed in the autumn of that year, it was sown with beans in the spring of 1875, and, after due cultivation, with Italian rye-grass again last autumn, yielding a magnificent first-crop this spring. A good deal of the second year's Italian rye-grass upon the farm this year is in anything but a satisfactory condition; and it seemed a pity that such immense stores of fertilising matter should be poured over land which is in this case covered with plants so little able to make good use of it. The sewaging for all grain-crops is confined to a winter irrigation of the land intended for spring-sown crops, and a watering in early autumn, if the weather permits, of the land that is to receive a wheat-sowing. The northern farm is well provided with buildings and roads; it is managed by a staff of 8 men and 4 horses, in addition to occasional hired labour as it is required at special times; and it has hitherto shown a considerable balance of receipts over expenditure other than rent—in fact, more than a fair agricultural rent of the land.

The southern farm, under Mr. Southon's management, includes 160 acres of exceedingly various soil. It lies for the most part in two valleys uniting above Groombridge Place Mill, whose mill-wheel limits the level of the final outfall. The lower fields of the main valley are in fair permanent pasture; the corresponding level of the lateral valley is little but bog-land; and with the imperfect drainage which alone is possible here, it might have been better planted with osiers; but this, too, is being brought under sewage irrigation, and has been roughly levelled and sown with Italian rye-grass for the purpose. The sides of the main valley are covered with a fair, and in places very fertile, loam; those of the lateral valley are for the most part a poor sand, which has been till lately a mere heath-clad surface. At the foot of the farm beyond this lateral valley there is a considerable area of fair agricultural land. The slopes are everywhere convenient for the purpose of a sewage farm, and the soil is much better suited for that purpose than that of the sewage farm in the northern valley. The sewage, about 300,000 to 400,000 gallons daily of dry weather flow, is brought 3 miles in a conduit to the upper end of the principal valley, where subsidence-tanks are provided for the separation of its heavier mud. From this point it is taken in a bricked conduit along one side of the valley, and in a syphon to a corresponding but somewhat smaller conduit on the other side. This, as having to feed the larger area of land, should have received the larger portion of the sewage, and the syphon, an 18-inch pipe, should have been capable of taking a larger flow. From these conduits, as on the other farm, the land receives the water at successive points, being distributed from contoured carriers made by plough and spade over successive areas of Italian rye-grass, mangel-wurzel, and occasionally summer and winter fallow. The land is drained, and the drainage-water of the higher levels is taken up for re-use on the lower; but here, too, complaint is made that the drainage is not altogether satisfactory. There is less demand for Italian rye-grass here than at the northern farm, which is one-half nearer the town; and one shilling a rod is here the maximum price. Of the 39 acres of Italian rye-grass on the farm last May, 9 acres had been sown in the spring of 1876, about 15 acres in the spring of 1875, and 15 acres in the spring of 1874; and a large extent was in a comparatively unproductive and unprofitable state, and has no doubt been ploughed up before this and received a good summer fallow for wheat next year. A great deal of the land, formerly a heathy sandy moor, is only now being brought into use; and it is so admirably adapted for dealing with the sewage nuisance, if not of producing the maximum agricultural produce by its use, that it seems a pity that the whole of the town sewage could not, whether by tunnel or otherwise, have been discharged at the southern outfall, and thus have been avoided one-half the management and other expenses connected with the provision of a double quantity of land.

The cropping of the southern farm includes no less than 17 acres of hop-ground, nearly 50 acres of wheat, barley, oats, and beans, 30 acres of permanent pasture, and a good deal of bare fallow; for some of the land is only in process of being got out of the wilderness condition in which it has hitherto lain. Accommodation has been provided for a large herd of cattle, which, with other stock, are maintained here for the consumption of the grass. A good deal of expenditure has been incurred in the management and equipment of the hop-grounds, which are no part of a sewage farm, and to this, to a considerable extent, is due the large amount of farm capital which is here invested. A gradually diminishing balance of return has hitherto been realised towards the enormous rent which this, like the other farm, has to bear. The following figures represent the annual expenditure and receipt.

Year.	Costs and Returns of Southern Sewage Farm.		
	Valuation and Expenditure.	Receipts and Valuation.	Profit.
	£ s. d.	£ s. d	£ s. d.
1870-1	1351 8 0	1880 18 4	529 10 4
1871-2	3068 18 5	3588 11 1	519 12 8
1872-3	4103 14 3	4486 19 5	383 5 2
1873-4	4346 15 3	4471 12 2	124 16 11
1874-5	4529 6 2	4569 17 4	40 11 2
1875-6	5206 12 5	5262 19 10	56 7 5
Total .	22606 14 6	24260 18 2	1654 3 8

Tunbridge Wells, like Cheltenham, delivers its drainage-water by gravitation to its sewage farms upon a lower level. Unlike Cheltenham, it has become burdened with very heavy law, Parliamentary, and engineering costs. Unlike Cheltenham, too, it has had to pay enormously for the land which it has had to buy; and though with one-half the population of that town, and with therefore not more than half its quantity of filth to cleanse, it has spent more than four times as much in the abatement of the nuisance it had created.

BEDFORD.

Bedford, with nearly 20,000 inhabitants, receives 250,000 gallons of water daily from its waterworks; and this, with much ordinary subsoil drainage water in addition, passes into its sewer, thus delivering about 700,000 gallons daily to its pumping station about a mile out of the town, where that quantity is lifted every day on to about 180 acres of very suitable land close by. Of this area 29 acres are Corporation property, and the rest is hired on lease of twenty years from the Duke of Bedford, the Rev. J. C. C. Campion and Captain Polhill-Turner—and the whole, at a rental of 917*l.* 4*s.* a year, costs a little more than 5*l.* per acre. To this, however, must be added the annual burden created by a very large outlay, 16,657*l.* 1*s.* 7*d.*, on engineering works, buildings, embankments, and pumping-apparatus; and to the annual payment for the discharge of this large sum in thirty years there must be added about 360*l.* a year as the cost of pumping, before the whole of the burden per acre is arrived at to which the agricultural and engineering rents amount. No land on which either to cleanse or utilise town sewage could be better fitted for the purpose; but so heavy an annual cost as this is clearly beyond the power even of the most productive market-gardens to meet. Twenty acres of the land, which is generally level, is surrounded by the covered piping into which the pump delivers the sewage, and is laid out in ridges some 30 yards in width, with a fall of at least 12 inches from the ridge-line to the furrow. The sewage being let flow from the higher embanked pipe, passes along these ridges, where 9-inch half-round tiles, placed end to end and bedded in the soil, form its carriers; and it lips over the edges down the slope. The land is on a bed of gravel, so that a very few drains suffice to keep its subsoil empty, and the surface is thus not easily clogged with any quantity of sewage, which indeed sinks away as it flows, so that there is rarely any water to deliver in the furrows between the lands. The heaviest Italian rye-grass, mangel-wurzel, and cabbage crops are grown, and nowhere is there seen more luxuriant fertility as the result of sewage irrigation. There has always been a very heavy produce of Italian rye-grass, onions, potatoes, cabbages, mangels, parsnips, and other succulent crops upon the land when I have walked over it. Besides this carefully laid-out square of 20 acres, with a roadway through the midst of it, the sewage is delivered at various points of all the other fields, and these, laid out less carefully, are watered in like manner from surface furrows along the higher lines in each, and very heavy crops are grown. The cropping last year included 22 acres of Italian rye-grass, sold for 399*l.* 0*s.* 6*d.*; 6 a. 1 r. 10 p. of cabbage, sold for 87*l.* 12*s.*; 40 a. 2 r. 20 p. of mangel-wurzel, sold for 599*l.* 6*s.* 6*d.*; 25¼ acres of potatoes, sold for 140*l.* 16*s.* 6*d.*; 10 acres of onions, sold for 287*l.*; 14 acres of oats, sold for 135*l.*; 16 a. 1 r. 10 p. of wheat, sold for 228*l.* 13*s.* 9*d.*; 7¾ acres of carrots, sold for 116*l.* 1*s.*; and 8 a. 2 r. 10 p. of gardening crops—as rhubarb, cucumbers, cauliflowers, red cabbage, asparagus, vegetable marrows, &c., sold altogether for 119*l.* 16*s.* 11*d.* The produce has been sold by auction on the land. The successive cuttings of Italian rye-grass have been sold by auction from time to time during the year. From 20 acres of permanent pasture, the sum of 181*l.* 10*s.* 6*d.* has been obtained; and altogether 180 a. 3 r. 30 p. have yielded 2294*l.* 17*s.* 8*d.*, or nearly 13*l.* an acre. But large as these sums appear to be, the heavy expenses which have been incurred leave but little balance available to meet the enormous burden of rent-charge which overwhelms the land. The statement for 1875 of farm returns and farm expenses, including rent for land (917*l.* 4*s.*), but not including the charges for pumping, or for the discharge of debt, shows indeed an almost exact balance of accounts, leaving the cost of pumping (344*l.* 7*s.* 4*d.*) and the rent-charges created by the outlay on engineering works, buildings, pumping-apparatus, &c., as an annual charge upon the town.

No question can arise here about the efficiency of the farm as a sewage defæcator; but great as are the crops which it has yielded, it cannot be considered an example of profitable sewage utilisation. Even supposing the depth through which the sewage percolates to its escape to be only 3 feet (which is certainly less than the quantity of soil and subsoil which in dry weather is available), the 180 acres held by the Corporation are enough under careful management (according to Dr. Frankland's laboratory experience) to cleanse the fæcal waste of nearly 200,000 persons; so that under the most careless management, *i.e.*, management which takes no care at all directly for the cleansing of the sewage, but is directed simply to the use of it as a manure for plants, there is not a chance of the drainage water from this farm creating a nuisance. It is, therefore, exclusively to the subject of farm profit that the Corporation of Bedford may direct its attention; and the farm is so perfectly adapted for the use of sewage, and so fortunate in its position in the midst of a district of for the most part arable land, and close by a prosperous and considerable market town, that if ever land will repay the cost of pumping the sewage that is applied to it, it must be here.

CONCLUDING REMARKS.

In addition to these sewage farms (six examples, including seven holdings: two of them—Cheltenham and North Tunbridge Wells—a stiff clay; three of them—Bedford, South Tunbridge Wells, and Doncaster—light soils; and two—Leamington and Chorley, of medium character: three of these examples, Cheltenham, Chorley, and Tunbridge Wells, receiving their sewage by gravitation; and three, Leamington, Doncaster, and Bedford, receiving their sewage by pumping), I have visited for the purpose of this report several other instances of sewage farming—West Derby, Walton-on-the-Hill near Liverpool, Altrincham, Blackburn, and Wrexham—in Cheshire, Lancashire, and Derbyshire. I am also well acquainted with other English sewage-farms—as those of Aldershot, Banbury, Birmingham, Bury St. Edmunds, Crewe, Croydon, Eton, Harrogate, Harrow, Kendal, Malvern, Norwich, Reading, Reigate, Romford, Rugby, Swindon, Warwick, Wolverhampton, Worthing. In addition to this I had for two years charge of the Lodge Farm near Barking, where the Metropolis Sewage Company have used from 300,000 to 600,000 tons of sewage annually during the past ten years, and I have narrowly watched its management during all that time, first, under the Hon. H. Petre, and for the last six years by Mr. H. J. Morgan, the Secretary to the Company. To some of these farms, and notably to those at Aldershot, West Derby, Wrexham, and Barking, I shall refer in justification of the conclusions on the whole subject, which I desire to draw especially from the six sewage farms which I have more particularly described. All of them, however, may be properly named, to show that it is not without considerable knowledge and experience of the subject that I now proceed to discuss the lessons which they appear to teach.

In the first place, we may notice how ludicrously experience hitherto has almost everywhere upset the anticipations of the sanguine sewage agriculturist. What has become of the estimates, the commonplaces, as they may be called, of all previous writings (some of them my own) on the sewage question from the agricultural point of view?—"A man as good as a sheep," worth, therefore, at least 5*s*. a year for the mere fæcal waste, in either case, of the animal! "Land a mere machine, of which the value necessarily hinges on the quantity of raw material which can be passed through it in a given time"! "The experience at Edinburgh, where a rent of more than 20*l*. an acre is annually paid for the sewaged meadows, of course attainable elsewhere"! Nothing of all this has been realised; 40,000 "man" have not raised the fertility of the Cheltenham sewage-farm so much as 400 sheep could have raised it. The poor sands and clays of the Tunbridge Wells farms, dealing as a machine with the enormous quantity of raw material supplied to them, more than 1,000,000 tons of sewage annually, have not been able to convert the fertilising matter from 80 "man" per acre, so as to pay their rent. Nowhere has the Edinburgh experience been realised. Everywhere else we have had to encounter the great difficulty of making a market for our produce—a market which has from time immemorial existed there. The disappointment has arisen from the one-sided view that has been taken of the question—the enormous quantity of fertilising matter at present going to waste alone occupying attention. Such quantities of ammonia, phosphorus, and potash in this sewage—equal, at the rate of application, to tons of guano annually on every acre—were certain to produce the very maximum of agricultural return, and needed, or at any rate deserved, the most perfect, not to say costly, equipment of land and farm for their reception. On this point—here also happily able to quote myself—I will extract a warning written so long ago as 1869, in a report to the West Derby Board of Health, who were then contemplating the adoption of the agricultural remedy for their sewage nuisance—a warning which was not taken then, and is still as necessary now:—"Having obtained the land, I would not interfere at once even with the existing tenancy, except to reserve the right to take field after field in hand as may be necessary for the purpose of fitting it for the reception of the sewage. And this gradual and, so to speak, domestic way of working out the problem, I advise, in order that there be no temptation to anything like the costly or heroic style, proper enough, possibly, to architectural or engineering works, certainly not to agricultural works. No doubt, engineering skill will be necessary after the sewage has been delivered on the highest point of the land, but its regular distribution is even more an agricultural operation, and the more it is kept within the means and ideas of an intelligent tenant-farmer or market-gardener, the more likely is it to have a profitable result. It is true that sewaged lands are generally the most enormously manured, and the most extraordinarily productive lands known to agriculture; but it is also well to bear in mind that sewage-water is the most dilute and poorest manure per ton that any of us know, that its effects are owing to the enormous quantities which we apply, and that any addition to the cost of its distribution must therefore be carefully avoided; for, after all, it is on the power which a single man possesses, by lifting or shutting a hatch here and there, of distributing 500 tons per acre over eight or ten acres in a day that our hopes of a profitable result very materially depend in dealing with such a weak and dilute manure as sewage almost always is."

The first lesson, then, that these and all other sewage farms may teach us is, that sewage—a very poor and weak manure—will not bear a heavy cost for distribution. The dirty water must indeed, at whatever cost, be brought to the land whether by pumping or by gravitation; but that is the business of the town which desires its defæcation. It must be brought to every field upon the farm, but thereafter it must be distributed in the cheapest possible way. Plough-made furrows are enough to regulate the flow where sufficient slopes naturally exist; and where the land is flat it must be laid out, after efficient drainage has been provided, in wide ridges, the surface soil being kept uppermost. The lighter, poorer, and more pervious soils, are to be preferred, and these are to be so laid out in lands that the sewage shall trickle downwards from a furrow along the ridge line, reaching the foot of the surface which it has to feed on either side, but sinking away in the process, until there is nothing left for the midway furrows to remove. It is possible thus so to arrange the surface that a single man may be able, as I have said, to distribute 5,000 tons of sewage daily. The cost of labour rules here as in most other agricultural speculations; and it may well be that a town shall resolve after having thus laid out its sewage farm to cover it with a coat of permanent grass, satisfied with thus ensuring the defæcation of its sewage at a minimum annual expense; and regardless of the possibility, at a somewhat greater expense of labour, of obtaining from the sewaged area a much larger agricultural return. Ordinary grazing and occasional mowings of land permanently laid down, after being properly arranged as a sewage farm, would very likely yield revenue enough to pay the labour bill and rent, which is what few sewage farms at present do. This, however, would be a very poor result of sewage irrigation; and it would never be satisfactory to throw to waste 200 ounces of ammonia per annum from every individual of a town population—regardless of its enormous fertilising power—even though we had succeeded in our first purpose of destroying its power of creating a nuisance.

The second lesson which agricultural experience hitherto of town sewage teaches applies to those who are bent upon making this farther use of it. They must not think that those plants which most require its ammonia, and phosphorus, and potash, are necessarily the plants best fitted for their purpose. They must choose such plants for cultivation as can prosper under the enormous quantities of water by which in sewage these ingredients are conveyed. Italian rye-grass is their principal resource, but cabbage, mangel wurzel, garden crops, and all other succulent growths, are suitable.

It is not impossible that we may hereafter hit upon a crop rotation, including as its chief feature Italian rye-grass for summer use and mangel-wurzel for winter use, with sale enough of these and other produce for the purchase of whatever other food materials are required, by which the sewage of a town may be converted wholly into milk. And a most desirable and wholesome upshot this would be. The outcry that has been raised against the wholesomeness of food which has been grown, whether at first or second-hand, from sewage dressings has nowhere been justified by experience. Edinburgh for many generations has been fed on sewage-produced milk. Merthyr has been fed to a large extent for several years on the garden-stuff produced abundantly upon Mr. Bailey Denton's filtering-ground, which is daily soused with tenfold the ordinary agricultural sewage dressing. The inhabitants of Cheltenham and Leamington, and the Eton boys—all of these being places where the authorities are naturally especially jealous for the wholesomeness of all their circumstances—are all of them fed more or less on milk from cows feeding on sewage-grown grass. But this is a digression.

The second lesson, then, of recent agricultural experience is that only plants of succulent growth deserve cultivation under sewage. Where the sewaged area is only a small part of a larger farm, the tenant can, no doubt, act as he pleases. He will of course have a large area in corn crops, and he may be tempted on occasion to apply a sewage dressing during a drought, where under ordinary circumstances it might be mischievous. Even he, however, will for the most part confine himself to Italian rye-grass and a few other green crops on his sewaged plot, and depend on the manure from the cattle fed on the sewaged grass and mangel-wurzel, for distributing the fertilising influence at his command over the rest of his land. On wholly sewaged farms the tenants will apply the bulk of the sewage to Italian rye-grass, and occasionally to mangels, cabbages, and other growing green crops, during summer, and to fallow-land for mangels, cabbages, and potatoes during winter, trusting the land to do what it can at that time to extract and store up for next summer's use the fertilising matters which are then spread throughout it. At Wrexham, where Colonel A. Jones makes his sewage farm profitable, the market-garden plot is one of the most productive fields he has. And at Aldershot, where Mr. Blackburn also finds sewage farming profitable, the large area in potatoes grown every year upon what is naturally a worthless sand yields, after repeated winter sewagings, one of the largest items of his income. At Barking, where cabbages, and other garden crops, and mangel-wurzels are largely and profitably grown, the dependence is on occasional dressings during the summer when the plants are in full growth and want feeding, not at all on winter dressings, which indeed are not forced on them as they are on the farms below ordinary towns; they pump only when they want to do so, and confine themselves therefore to such times as suit their crops.

And here we come to the third lesson which these farms teach, and which cannot be too strongly impressed upon the sewage-farmer. The selection of such crops for growth as alone can make good use of such a dilute manure must be hedged within still narrower limits; and in the case even of a crop which may be sanctioned by the second rule of conduct, just referred to, we must resolutely and promptly condemn it and abandon it as soon as it has lost its fitness or its power. This caution applies chiefly, and, so far as I know, exclusively to Italian rye-grass, which is often seen on sewage-farms even in its second year, and still more in its third year, utterly effete and incapable; although in its first year, when receiving no better or more abundant feeding, it was enormously productive. Mr. H. J. Little was quite right in pointing out the blunder which Italian rye-grass growers often commit on sewage-farms of keeping it too long. There is nothing more beautiful of its kind —nothing more convincing of the extraordinarily fertilising agency which we have in sewage—than a field of Italian rye-grass ready for one of its earlier cuttings during its first year. Sown in August or early in September, and properly sewaged afterwards, it is in April of the following year the most wonderful picture of fertility which English agriculture knows. Let the land, however, be ploughed up in the following November. Its second year will not be half so satisfactory; and the land will do better, after a winter sewaging, in early potatoes removed for another rye-grass seeding in the following autumn, or for mangel-wurzel to be followed by cabbages in the third year; these to be removed for an autumn seeding. In its second year, Italian rye-grass is rarely satisfactory; the same fertilising agency is applied to it, but the plant itself is gradually becoming incapable.

The three lessons, then, which may, I think, be learnt of the farms to which I have referred are (1), the need of inexpensive distribution; (2), the necessity of choosing fit crops for cultivation; (3), the need of confining our cultivation even of these to that period in the life and growth of each during which it retains in full vigour its power of assimilating the abundance of food for plants with which we supply it.

One of the greatest difficulties which have to be encountered in sewage-farming is that of finding a market for its produce. This was pointed out more than ten years ago in a paper read before the Society of Arts, on London sewage from the agricultural point of view; but the assertion of this particular difficulty was then received with hilarity, and I was ironically congratulated on my anticipation of the disaster which was to arise from "a plethora of produce." It is a real difficulty, nevertheless. It may, to some extent, be met on the heavier class of soils by the expedient of ploughing a great deal of produce under during the first year or two, when a sale of milk or grass or garden-stuff is only gradually growing. Italian rye-grass may be repeatedly ploughed under with advantage to the soil, especially on land stiffer than is desirable for sewage-farming. This in time will render it mellower and more manageable. The main resource, however, failing a direct sale of produce, will be found in the maintenance of live stock. There is no better food for milch-cows than sewage-grown Italian rye-grass; and, when withered somewhat before being given, it will do well for any kind of stock. And a good stock-manager would, I believe, find little difficulty in maintaining on a properly equipped sewage farm a large and healthy herd of all ages. A large number of calves could be reared, on a comparatively small number of cows, throughout the year, and thus stock of all ages could be kept from year to year, until of full age for the grazier or breeder. In this way, in milk production, and in a gradually growing market on the ground for Italian rye-grass and for mangel-wurzel, cabbages, and other vegetables, the difficulties of a sewage-farm, greatest in the marketing department, will gradually disappear. And if, by good management, the labour-account can be kept within reasonable limits, a profit may be ultimately looked for. The experience hitherto has not been wholly discouraging. The Doncaster and Leamington farms —both of them in private hands—are perhaps the most hopeful of the six that have been described. The Cheltenham farm, where the profit arises out of the small amount of the annual labour-bill, is also instructive. The Tunbridge Wells and Bedford farms, and in a less degree the Chorley farm, and in a much greater degree the Blackburn farm, must be taken as a warning against excessive expenditure.

Meanwhile, it may be held as certain that the agricultural remedy for the sewage nuisance is alone trustworthy. None of the chemical methods having to deal with a putrescible liquid can send it from them in a non-putrescible condition. The agricultural remedy alone is perfectly efficient. A putrescible liquid passing through the aërated soil—and over that incalculable quantity of surface, within it, to which the superficies of all its particles amounts—meets with the oxygen of the air under circumstances which promote, hasten, and produce the chemical transformation which it requires in order to its perfect defæcation. Its organic matters are thus oxidised and transmitted in a condition in which they are no longer capable of creating a nuisance. This is the explanation of ordinary agricultural experience on a sewage farm, to which Dr. Frankland's laboratory experiments, conducted with admirable insight into the conditions of the problem, have directed him. It is the explanation of the perfect efficiency of his method of downward intermittent filtration—a sufficient depth of soil and subsoil being filled alternately with sewage and with air—which is just an intensive form of the ordinary agricultural experience on a well-managed sewage-farm. And whether on the extensive or intensive scale, this, whatever be the expense of it, is the only process capable of dealing efficiently with a liquid in which the mischievous organic ingredients, filthy as they may be, are, nevertheless, in such extremely dilute solution as they are in town sewage. From this method alone, moreover, on the extensive or agricultural scale, is there any hope of extracting a produce which will contribute in any sensible degree to the expense of the process. Let us hope that this discussion of some of the cases in which it has recently been adopted, may lead to a more profitable result than has hitherto been achieved.

I add one word more on the policy which Mr. Bailey Denton strongly urges of having somewhere on every sewage farm a sufficient area set apart expressly for intermittent downward filtration, "not to be considered and treated as intensified irrigation, as it has been called, but designed and carried into operation as a distinct work to be utilised at all times when it would prove the *safety valve* to irrigation.' I quote these words from his paper read before a meeting on river purification, held at Edinburgh on the 16th of January, 1873.* His contention appears to be that this expedient will tend to make sewage more palatable to the farmer and more susceptible of profitable use by helping him under the difficulty—occasionally it is believed a costly difficulty—under which, of course, he is placed of having to deal with all the town sewage daily, whether he has crops fit for it or not. When none of his land is fit for turning sewage to profitable use, this intermittent filter will be ready in which to kill or destroy it; and thus he will not be forced to apply it to his land at the risk of injury to it or to the crops it bears.

It seems to me that Mr. Bailey Denton's proposition is especially acceptable only in those cases where the land is not naturally sufficiently porous for easy filtration over the whole farm. In that case, unquestionably, it may be desirable to select the most suitable plot for special equipment as an apparatus for merely oxidising and defæcating sewage. But where the whole of the land is pervious and suitable for the work of sewage defæcation, to set apart a portion which may be loaded with the work more heavily than the rest seems to me like an attempt, if possible, to achieve a failure. For the power which the land, and the air within it, possesses of converting sewage into a non-putrescible liquid is, of course, limited, even under the most favourable circumstances; and the work is more likely to be perfectly complete when the sewage is distributed over and throughout a large quantity than over and throughout a small quantity of aërated earth. It is, I submit, precisely the same process on which you depend for sewage defæcation whether you employ a drained and irrigated farm or a drained and irrigated filter-bed; only the former, supposing it to be sufficiently porous and well drained, having less to do per acre, is more likely to do it thoroughly; and, having a larger area on which a profitable crop may be at the same time cultivated, it is the more likely to make a considerable contribution by its produce towards the repayment of the costs which have been incurred.

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* Edinburgh: Edmonston and Douglas.

XVI.—*On Phosphatic Guanos.* By Dr. AUGUSTUS VOELCKER, F.R.S.

GUANO, it is well known, is the name given to the accumulated fæcal matters (chiefly of sea-birds) which have been deposited on different parts of the earth's surface in greater or less purity, and have sustained more or less change by the subsequent action of the atmosphere. The quality and value of different kinds commercially depend almost entirely upon the amount of decomposition which they have undergone by the action of rain, and other atmospheric influences.

The recent droppings of sea-birds which have fed upon fish, a highly nitrogenous food, consist chiefly of uric acid, urea, urate of ammonia, and a variety of other nitrogenous organic compounds, and variable proportions of the phosphates of lime and magnesia, phosphate and sulphate of potash and soda, chloride of sodium, and some other saline matters.

The nitrogenous organic portion constitutes fully two-thirds of the dry birds'-dung, and the phosphatic and saline inorganic substances form the remaining one-third.

In dry climates, where little or no rain falls—as in some parts of Peru and Bolivia, on the western coast of South America—the droppings of the sea-birds suffer little from the action of the atmosphere, so that the greater part of the nitrogenous matters, and the whole of the saline and phosphatic constituents of the birds'-dung, remain in such guano-deposits.

The most recent deposit of birds'-dung brought under my notice was obtained from a rocky promontory on the Bolivian coast, called Angamos. Occasionally a small cargo of Angamos guano finds its way into England, and meets with a ready sale, as it is, when pure, an extremely valuable manure. Angamos guano is collected by hand, with considerable danger and difficulty, from the bare surfaces of the precipitous cliffs frequented by the sea-birds. Being produced only in very limited quantities, it is not of much practical importance to the farmer. Its composition, however, presents several points of interest, to which I would invite the attention of the reader. (See Table, p. 441.)

Both samples were very dry; they had a light-yellow colour, and a fishy, but by no means pungent, smell. The one contained as much as 21·15 per cent. and the other 19·3 per cent. of nitrogen, or considerably more than the best Chincha Island guano which ever passed through my hands. In the finest samples of the old and now exhausted Chincha Island guano I found in round numbers 16 per cent. of nitrogen, which is equal to about 19½ per cent. of ammonia; and on an average the bulk of the deposit

COMPOSITION OF TWO SAMPLES OF ANGAMOS GUANO.

	No. 1.	No. 2.
Moisture	7·24	8·76
*Organic matter and salts of ammonia	69·01	69·96
†Phosphates of lime and magnesia (bone-phosphate)	12·06	12·07
Alkaline salts (salts of potash and soda)	9·02	8·27
Insoluble siliceous matter	2·67	·94
	100·00	100·00
* Containing nitrogen	21·15	19·30
Equal to ammonia	25·68	23·44
† Containing soluble phosphoric acid	Not determined	3·01
Equal to tribasic phosphate of lime rendered soluble by acid	..	6·57

on the Chincha Islands furnished guano yielding from 16½ to 17 per cent. of ammonia.

This is considerably less than I found in the two samples of Angamos guano to which reference has been made. On the other hand, the percentage of phosphate of lime and magnesia in the best samples of Chincha Island guano is much greater than in these two Angamos guanos.

Recently deposited and rapidly dried dung of sea-birds, collected almost as soon as it is produced, in a hot climate, and not acted upon by rains, thus contains a larger percentage of nitrogenous organic matter and a smaller percentage of phosphates than the birds' droppings which have continued to accumulate probably for centuries, and have formed more or less extensive layers, varying from 20 to 10 feet in thickness.

In the course of many years, a portion of the nitrogenous organic matters of guano appears to be dissipated even in places most favourably situated for the preservation of the soluble fertilising constituents of birds'-dung. On fuller examination I found that the two samples of Angamos guano had undergone no decomposition. This guano smelled fishy, and more like fresh urine than Peruvian guano.

Both samples, when tested with blue litmus-paper, reddened the test-paper distinctly, whereas Peruvian guano has always a somewhat pungent smell, and a decidedly alkaline reaction.

The presence of uric acid and acid urates in the Angamos guano explains its acid reaction. Thoroughly wetted with water, and kept in a warm room, Angamos guano in the course of a couple of hours suffers decomposition, and gives rise to carbonate of ammonia, the presence of which is readily indicated by placing a little of the wetted guano upon reddened litmus-paper, when its original blue colour will at once be restored.

By this simple experiment it will be seen how rapidly the urea and compounds of uric acid of birds'-dung are transformed into carbonate of ammonia in the presence of water. Most guanos which have a strongly pungent ammoniacal smell, and are dark coloured, are poorer in nitrogen and richer in phosphates than lighter-coloured and less pungent-smelling samples of the same kind. The former, as a rule, contain more ready-formed carbonate of ammonia and less uric acid than the latter, which, however, are more valuable, inasmuch as the total percentage of nitrogen, which mainly regulates the value of such guano, is higher than in dark-coloured and pungently smelling samples.

The first effect of water upon birds'-dung is to transform its urea and uric acid partly into volatile carbonate of ammonia, which gradually escapes, and partly into non-volatile soluble salts of ammonia, whilst at the same time a portion of the insoluble phosphates are rendered soluble. If, in this partially decomposed condition, the guano is exposed to occasional heavy rains, the most valuable soluble ammoniacal constituents and the soluble phosphates will be removed to a greater or less extent, according to the amount of rain which will have acted upon it. The partial removal of the nitrogenous constituents is the cause of the inferior quality of the guano-deposits which are found in the Falkland Islands, on the Patagonian coast, and in various other places in South Africa, Bolivia, and Chili, such as the Ichaboe, Saldanha Bay, Bolivian, Upper Peruvian, Chilian, and Californian guanos. If the solvent action of water continues to operate for a long time upon guano-deposits, the nitrogenous constituents of the original birds'-dung are almost entirely removed, together with the soluble saline mineral matters, so that finally phosphatic guanos are produced, which consist principally of phosphate of lime. Most of the phosphatic guanos are yellow or light brown, or chocolate- or reddish-coloured, fine powdery manures, which still contain more or less organic matter poor in nitrogen. In this way the phosphatic guanos which are found on a number of islands in the Caribbean Sea and in the South Pacific Ocean have been produced. Some of the South African and South American guanos also belong to the class of phosphatic guanos. All true guano-deposits, according to their composition, may conveniently be divided into three classes:—

1st. Nitrogenous guanos, consisting chiefly of the fæcal matters of sea-birds, which have suffered little by the action of rain, and which retain the greater part of the nitrogenous constituents originally present in the birds'-dung, and all the saline and phosphatic compounds.

2nd. Deposits which, like Ichaboe, Saldanha Bay, Bolivian, Chilian, and Upper Peruvian guanos, have lost a more or less considerable portion of their nitrogenous soluble saline constituents. The guanos belonging to this class generally contain from 2 to 4 per cent. of ammonia.

3rd. Guanos which have lost nearly all their nitrogenous constituents, and consist principally of the earthy phosphates of the animal deposit, and some organic matter which has resisted the solvent action of the water which converted the original deposits into phosphatic guanos.

Many of the latter are contaminated with fine sand, and some also with carbonate and sulphate of lime.

It is not my purpose in this paper to treat of the two former classes, and I shall confine myself to the chemical history of phosphatic guanos. This contribution to the pages of our 'Journal' I trust will form a useful, although perhaps not very interesting, sequel to my paper on "Phosphatic Minerals used in Agriculture," published in a preceding volume of the 'Journal,' and complete the account of the great variety of phosphatic materials which at the present time are placed at the command of manufacturers of artificial manures, and in one shape or other are made subservient to the needs of British agriculture.

PHOSPHATIC GUANOS.

Phosphatic guanos, as stated already, are produced when water acts upon deposits of birds'-dung to such an extent that nearly the whole of the nitrogenous organic constituents of the dung are converted into soluble salts of ammonia, which, together with the soluble saline matters, are washed away, and little else but the phosphates of lime and magnesia of the original animal deposits, more or less pure, are left behind. All true phosphatic guanos contain some organic matter, and with it at least traces of nitrogen. Most kinds yield from one-third to one-half per cent. of nitrogen, and some as much as three-fourths to one per cent. Ammoniacal salts, as a rule, are absent, or present only to a limited extent. However, there is no distinct line of demarcation which separates phosphatic from ammoniacal guanos, and some may be described under one head with as much propriety as under the other.

Our principal supplies of phosphatic guanos come from South America, South Africa, a number of islands in the Caribbean or West Indian Sea, and several uninhabited islands in the South Pacific. From these places we obtain the following varieties, which have from time to time been brought under my notice :—

1. Mejillones Guano.
2. Patagonian and Falkland Island Guano.
3. Patos Island Guano.
4. Raza Island, or Gulf of California Guano.
5. Curaçao Guano.
6. Quito Serrano Island Guano.
7. Petrel Island Guano.
8. Coral Island Guano.
9. Booby Island Guano.
10. McKeen's Island Guano.
11. Baker Island Guano.
12. Howland Island Guano.
13. Jarvis Island Guano.
14. Birds' Island Guano.
15. Malden Island Guano.
16. Shaw's Island Guano.
17. Flint Island Guano.
18. Enderbury Guano.
19. Starbuck Island Guano.

Besides these varieties, others have been examined by me, but as I have not been able to trace their origin, I pass them over and confine my remarks to the preceding kinds.

Mejillones Guano.—Although it has long been known that guano-deposits of great extent exist in the high table-land near the coasts of Bolivia, between Peru and Chili, a little below the tropic of Capricorn, it is only during the last few years that these deposits have been systematically explored. At the present time a good many cargoes of one of the most valuable phosphatic guanos are annually shipped to England from Mejillones Bay, which is but a short distance from the principal guano-deposits, situated about 1700 feet above the sea, towards the base of the Marro de Mejillones, a mountain 2600 feet high.

This deposit is of great extent, and varies in depth from 5 to 20 feet, and in some places reaches a depth of 40 feet. A second deposit, not yet fully explored, occurs at La Tetas, north of the principal one. The quantity of available guano is variously estimated by the engineers who have surveyed the deposits. According to official statements there are from 2,000,000 to 4,000,000 tons, thus showing a wide margin in the estimates. It is next to impossible to form a correct estimate of almost any guano-deposits, but there appears to be no reasonable doubt that some millions of tons may be expected from Mejillones.

Mejillones guano has a bright-reddish colour, very similar to the colour of red ochre. The colour, however, I find is not due, as might be supposed,to red oxide of iron, but to a peculiar organic colouring matter, which turns much lighter and assumes a yellowish tint when the guano is hard dried.

About three-fourths of the bulk consists of fine powder, and the remainder of small lumps, which are readily crushed. The guano has a low specific gravity, and when mixed with water the greater part remains in suspension for a long time, showing that the particles of the guano are in a state of fine subdivision. In this respect Mejillones guano is distinguished favourably from other phosphatic guanos, the majority of which are more dense, and apparently mineralised to a greater extent, than the Mejillones deposits. It, moreover, contains a larger proportion of organic matter, including from one-half to three-fourths per cent. of organic nitrogen and small quantities of ammoniacal salts, as will be seen by the following complete analyses of several cargoes, samples of which have been sent to my laboratory for examination during the last few years:—

COMPOSITION OF MEJILLONES GUANO.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Moisture	8·76	7·45	6·61	7·09	6·38	7·45
*Organic matter and salts of ammonia	6·49	7·34	6·28	7·44	6·79	7·34
†Phosphoric acid	34·40	30·72	32·52	33·97	35·25	30·72
Lime	37·60	36·81	36·42	37·01	35·50	36·81
Oxide of iron	·54	·38	·64	·69	11·69	·38
Magnesia	2·83	8·56	3·42	2·83		8·56
Alkaline salts, including ..	5·76		5·62			
Chloride of sodium	(1·83)	(2·47)	..	2·87		(2·47)
Potash	..	..	..	·34		..
‡Carbonic acid	·45	·75	1·37	2·76		·75
Sulphuric acid	1·68	6·76	4·89	2·53		6·76
Insoluble siliceous matter ..	1·49	1·23	2·23	2·47	4.39	1·23
	100·00	100·00	100·00	100·00	100·00	100·00
* Containing nitrogen ..	·98	·89	·79	·93	·72	·89
Equal to ammonia ..	1·19	1·08	·96	1·12	·87	1·08
† Equal to tribasic phosphate of lime	75·09	64·06	70·99	74.15	76·95	67·06
‡ Equal to carbonate of lime	1·02	1·70	3·11	6·25	..	1·70

A glance at the preceding analyses shows, amongst other particulars—

1. The samples of Mejillones guano analysed by me contained from 6 to 7 per cent. of organic matter.
2. The organic matter in these guanos, on combustion with soda-lime, yielded an amount of nitrogen which is equivalent to about 1 per cent. of ammonia. The existence of nitrogenous organic matter clearly proves the comparatively recent character of the Mejillones guano deposits.
3. All the samples were rich in phosphoric acid. The percentage of phosphoric acid expressed as tribasic phosphate of lime (bone-phosphate) ranged from 64 to 77 per cent. in round numbers.
4. All contained but a small proportion of carbonate of lime.

5. Several of the samples contained a considerable amount of sulphuric acid, which appears to have been mainly combined with lime.

6. Mejillones guano also contains magnesia, amounting on an average to about 3 per cent.

7. Chloride of sodium (common salt) to the extent of about 2½ per cent. was also found in the several samples.

8. The percentage of insoluble siliceous matter (sand) varied from 1 to 4 per cent., in round numbers, in the six samples.

9. All contained but very little oxide of iron. Of alumina, only traces could be detected. Practically speaking, Mejillones guano may be regarded as free from oxide of iron and alumina.

On combining the proportions of carbonic and sulphuric acid with lime, and the magnesia with phosphoric acid to form tribasic phosphate of magnesia, it will be found that the remainder of the phosphoric acid in the preceding analyses is more than sufficient to form tribasic phosphate with the rest of the lime. It appears from these results that Mejillones guano contains, in addition to the ordinary bone-phosphate, a combination of lime with phosphoric acid, which is less basic than the tricalcic phosphate. Such a compound is bibasic phosphate of lime. The occurrence of this phosphate in Mejillones guano is of some practical importance, for it is well known that bibasic phosphate of lime is more readily dissolved by water, or perhaps, more correctly speaking, yields soluble phosphoric acid to water more easily than the ordinary tribasic phosphate. Or if we combine the lime with carbonic, sulphuric, and phosphoric acid to form carbonate and sulphate of lime, and tribasic phosphate of lime, an excess of phosphoric acid will remain, which, according to this mode of calculation, is united with magnesia to form monobasic or bibasic phosphate of magnesia, or a mixture of the two. These magnesian phosphates are still more soluble in water than the corresponding lime phosphates, and hence, whether we adopt one or the other modes of combining the basic with the acid constituents, the practical result remains the same in either case. Mejillones guano certainly is a more readily soluble and efficacious phosphatic manure than similar fertilisers which do not contain more phosphoric acid than is necessary to form tribasic phosphate with lime.

The greater readiness with which Mejillones guano yields phosphoric acid to plants, in comparison with other phosphatic guanos, its richness in phosphates, and the extremely fine state of subdivision of its particles, unquestionably characterise Mejillones guano as one of the most valuable phosphatic guanos at present imported into England.

In addition to the preceding more complete analyses, the following partial ones may be quoted as fairly representing the average contents of the present imports in phosphate of lime:—

GENERAL COMPOSITION OF MEJILLONES GUANO.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Moisture and organic matter	14·46	15·01	13·87	15·80	15·01	16·62
*Phosphoric acid	32·35	34·71	33·79	34·12	33·54	31·84
Lime	37·56	31·75	30·61	36·41	34·07	34·97
Magnesia, carbonic acid, sulphuric acid, alkaline salts, &c.	12·54	13·63	14·30	11·38	10·93	11·73
Insoluble siliceous matter ..	3·09	4·90	7 43	2·29	6·45	4·84
	100·00	100·00	100·00	100·00	100·00	100·00
* Equal to tribasic phosphate of lime	70·62	75·77	73·76	74·48	73·22	69·51

Although Mejillones guano may be applied with more or less advantage to the land without any previous preparation, except sifting and crushing the lumpy portion into a fine powder, it is more economical to treat the guano with sulphuric acid, and to convert the greater portion of the insoluble phosphate of lime which it contains into soluble phosphate. It is readily acted upon by dilute sulphuric acid, and is a most valuable material for producing manures containing a high percentage of soluble phosphate of lime. It has been alleged that Mejillones guano, when treated with sulphuric acid, does not readily fall to a fine and dry powder, but is apt to remain permanently in a wet and rather pasty condition. This, no doubt, may happen, and it generally takes place, if the guano, as imported, is treated with weak acid. Not unfrequently it arrives in Europe in a somewhat damp condition, and if dissolved in that state in weak chamber-acid, the resulting soluble guano appears more or less moist, according to the percentage of moisture in the raw guano, and the extent to which it has been rendered soluble by a larger or smaller addition of weak acid. But this objection to its fitness for the production of manures rich in soluble phosphate is not a valid one; for Mejillones guano, thoroughly dried on a heated floor, and then passed through a fine sieve, can be treated with an amount of sulphuric acid large enough to render nearly the whole of the insoluble phosphate of lime soluble, without danger of turning out damp and pasty. In this way, dissolved Mejillones guano, containing from 40 to 43 per cent. of soluble phosphate of lime, may be obtained in a sufficiently dry and powdery condition to go readily through a manure-drill.

Patagonian and Falkland Island Guano.—The character of these South American guanos varies extremely, and even the best samples are in reality much damaged by rain. Generally speaking, the deposits on the Falkland Islands are better than those found on the Patagonian coast. Falkland Island guano can hardly be called "phosphatic," for it contains, as will be seen by the subjoined analyses, a considerable amount of ammonia; and reference is made to it in this place, because guano, evidently from the Falkland Islands, is sometimes imported as Patagonian.

COMPOSITION OF TWO SAMPLES OF FALKLAND ISLAND GUANO.

	No. 1.	No. 2.
Moisture	33·43	35·86
*Organic matter and ammoniacal salts	21·42	26·07
Phosphates of lime and magnesia (bone-phosphates)	32·04	22·01
Carbonate of lime	2 52	5 64
Alkaline salts	6·22	7·34
Insoluble siliceous matter	4·37	3·08
	100·00	100·00
* Containing nitrogen	4·31	4·42
Equal to ammonia	5·23	5·37

Falkland Island guano is generally very wet and lumpy; it gives off a strongly pungent odour, and contains much volatile carbonate of ammonia, seldom more, and frequently less, than 5 per cent. of ammonia.

The variable character of Patagonian guano is strikingly exemplified in the following analyses:—

COMPOSITION OF PATAGONIAN GUANO.

	No. 1.	No. 2.	No. 3.	No. 4.
Moisture	21·46	19·55	6·59	22·18
*Organic matter and salts of ammonia ..	11·74	11·08	10·23	
Phosphate of lime and magnesia	27·61	16·58	23·44	20 01
Carbonate and sulphate of lime	2·99	8 92	..	27·94
Alkaline salts	6·07	9·39	9·05	
Insoluble siliceous matter (sand)	30·13	34·48	50·69	29 87
	100·00	100·00	100·00	100 00
* Containing nitrogen	1·83	1·20	·90	·62
Equal to ammonia	2·22	1·24	1·09	·75

The first of the four samples, it will be seen, yielded 2¼ per cent. of ammonia, and the fourth only ¾ per cent. All contained a large proportion of sand—No. 3 as much as half its weight. The percentage of phosphate of lime in the best sample amounted to only 27½ per cent., and in the worst sample it fell as low as 16½ per cent. Altogether, Patagonian guano, as a rule, is a poor manure; and in many cases it is not worth the freight and working expenses.

Patos Island Guano.—Patos Island lies off the coast of Lower California, and on it are found deposits of phosphatic guanos, which, however, appear to be now nearly exhausted. A sample of Patos Island guano, analysed by me some years ago, had the following composition:—

Composition of Patos Island Guano.

Moisture	14·35
*Organic matter and salts of ammonia	10·24
Phosphate of lime and magnesia (bone-phosphates) ..	53·48
Carbonate of lime	2·58
Alkaline salts	4·63
Insoluble siliceous matter	14·72
	100·00
* Containing nitrogen	·96
Equal to ammonia	1·16

Gulf of California and Raza Island Guano.—Much more valuable phosphatic guanos than that from Patos Island are now imported into England from Raza Island and other islands in the Gulf of California, as will be seen by the following analyses:—

COMPOSITION OF PHOSPHATIC GUANOS FROM THE GULF OF CALIFORNIA.

	No. 1.	No. 2.	No. 3.
Moisture	4·83	1·30	3·70
Organic matter and combined water	12·72	9·80	11·13
†Phosphoric acid	34·33	40·31	34·81
Lime	37·36	37·21	34·07
Magnesia	1·76	7·18	9·54
Oxide of iron	·50		
Alumina	·81		
Carbonic acid	·46		
Alkaline salts	5·54		
Insoluble siliceous matter	1·69	4·20	6·75
	100·00	100·00	100·00
* Containing nitrogen	1·04	·37	·86
Equal to ammonia	1·26	·45	1·04
† Equal to tribasic phosphate of lime ..	74·94	88·01	75·99

Two of these three samples contained a good deal of organic matter, capable of producing on final decomposition over 1 per cent. of ammonia. They were also rich in phosphate of lime, and altogether indicated very valuable phosphatic guano deposits. The sample marked No. 2 was remarkably rich in phosphoric acid, but it contained less nitrogen than the two other samples.

It appears to me probable that No. 2 was a crust guano, upon which the powdery portion was deposited. On many guano islands the powdery phosphatic deposits rest upon, or are mixed up with, hard unpromising-looking crusts, or stone-like masses, which often assume considerable dimensions, and possess the physical characters of hard rocks. In most places these crusts are more valuable than the powdery portion of the deposit, for in many localities the powdery surface-layers are contaminated with fine drift-sand, sometimes to an extent to render the guano not worth exporting. The crusts are not only free from sand, or contain but little of it, but they often consist principally of bibasic phosphate of lime, and not of the ordinary tribasic phosphate which forms the bulk of the powdery phosphatic deposit. In other words, these crusts not only contain a high percentage of phosphoric acid, but they contain this acid united with less lime than in ordinary tribasic or bone-phosphate of lime, which constitutes the bulk of bone-ash and of most phosphatic guanos and minerals.

The analysis of sample No. 2 shows that it is a crust guano, to a very large extent consisting of bibasic phosphate of lime. This circumstance renders this and other crust guanos of a similar chemical constitution extremely valuable for the production of high grade superphosphates.

In dissolving ordinary phosphatic materials, which often contain a good deal of carbonate of lime, a certain amount of sulphuric acid is wasted in neutralising it; and in order to produce soluble or monobasic phosphate of lime from the tribasic compound, two equivalents of lime are removed by the acid and changed into two equivalents of sulphate of lime; whereas in dissolving crust guanos, which generally do not contain any carbonate of lime, and which consist, to a large extent, of bibasic phosphate of lime, only one equivalent of lime has to be removed and to be combined with sulphuric acid when such crust guanos are transformed into soluble or monobasic phosphate of lime. In the former case, for every equivalent of soluble phosphate two equivalents of sulphate of lime (gypsum) are necessarily produced; whereas, in the latter, only one equivalent of sulphate of lime is formed simultaneously with one equivalent of soluble phosphate, and a much higher percentage of soluble phosphate can be incorporated into a manure which is made simply by dissolving such crust phosphates than is the case when ordinary phosphatic minerals are used.

The following is an analysis of a sample of Raza Island crust guano, which is very similar in chemical character to the sample marked No. 2 in the preceding tabular statement.

Composition of Raza Island Guano.

Moisture and organic matter	12·34
*Phosphoric acid	38·35
Lime	36·57
Magnesia, alkaline salts, sulphuric acid, &c. ..	8·71
Insoluble siliceous matter	4·03
	100·00
* Equal to tribasic phosphate of lime	83·72

A considerable proportion of this crust guano consisted of bibasic phosphate of lime.

Curaçao Island Guano.—The island of Curaçao, a Dutch possession, is situated in 12° N. latitude and 51° W. longitude, a few miles off the coast of Venezuela. It is a small island, sparsely inhabited, and abounds in sterile rocky districts in which phosphatic guano deposits were discovered not many years ago. Curaçao guano has a light greyish-brown colour, and like most deposits of that kind is free from smell. It is generally found in the shape of a fine voluminous powder, and is much liked by manufacturers of artificial manures, because when treated with sulphuric acid it is readily converted into a light, dry, and concentrated superphosphate.

COMPOSITION OF CURAÇAO GUANO.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6
Moisture	11·53	8·05	16·80	8·28	11·49	10·29
Organic matter	7·11	8·70	6·30	7·34	5·81	7·39
*Phosphoric acid	32·65	30·96	30·02	33·20	33·44	29·55
Lime	40·19	42·05	37·40	41·86	40·80	40·20
†Carbonic acid	2·30	3·79	1·19	2·93	1·86	3·74
Magnesia, sulphuric acid, alkaline salts, &c.	6·02	6·21	8·05	6·20	6·31	8·74
Insoluble siliceous matter ..	·20	·24	·24	·19	·29	·09
	100·00	100·00	100·00	100·00	100·00	100·00
* Equal to tribasic phosphate of lime	71·27	67·59	65·23	72·48	73·01	64·51
† Equal to carbonate of lime	5·22	8·61	2·70	6·66	4·27	8·50

Like most phosphatic guanos the deposit varies a good deal in different places on the island; but when care is taken in the selection of the different qualities, cargoes yielding from 67 to 70 per cent. and upwards of phosphate of lime may be shipped without much difficulty. The analyses on the preceding page give a good representation of the variation in the quality of this guano.

Curaçao guano thus contains scarcely any siliceous matter, from 64 to 73 per cent. of phosphate of lime, and a variable moderate percentage of carbonate of lime.

Quite recently a very rich rock phosphate has been discovered on Great Curaçao. A sample analysed by me a few months ago had the following composition:—

Composition of a Sample of Curaçao Rock phosphate.

Moisture	1·34
Organic matter	·84
*Phosphoric acid	37·53
Lime	51·80
†Carbonic acid	4·28
Magnesia, sulphuric acid, &c.	3·87
Insoluble siliceous matter	·34
	100·00
* Equal to tribasic phosphate of lime	81·93
† Equal to carbonate of lime	9·72

This is a hard light-coloured rock, well adapted for the manufacture of concentrated mineral superphosphate.

In the next tabular statement (p. 453) are grouped together analyses of samples of Quito Serrano guano, Petrel Island guano, Coral Island guano, Booby Island guano, and McKeen Island guano, varieties of phosphatic guanos which are occasionally imported into England, but which do not appear to form very extensive deposits.

The sample of Coral Island guano analysed by me, it will be seen, contained 77 per cent. of phosphate of lime, which is a high percentage; but the Booby Island and McKeen Island guanos are not rich enough to repay the expenses of exportation.

Baker Island Guano.—Baker Island, a small uninhabited coral island, surrounded by coral reefs, is situated in the West Indian, or Caribbean Sea, at an elevation of about 25 feet above the level of the sea. It is the resort and breeding-place of great numbers of sea-birds, the excrements of which give rise to the guano deposit. Unfortunately the island is visited periodically by heavy rains, which deprive the birds'-dung of its most valuable fertilizing constituents, and leave mainly the earthy phosphates, mixed with more or less organic matter, behind.

COMPOSITION OF SAMPLES OF:—

	Quito Serrano Island Guano.	Petrel Island Guano.	Coral Island Guano.	Booby Island Guano.	McKean Island Guano.
Moisture	8·50	9·51	7·04	6·10	12·55
*Organic matter			11·76	10·18	9·59
†Phosphoric acid	32·44	30·50	35·29	21·77	22·68
Lime	39·41	36·44	41·76	45·36	36·24
Magnesia, sulphuric acid, alkaline salts .. .. .. Carbonic acid, &c.	17·10	18·05	3·55	16·50	18·15
Insoluble siliceous matter ..	2·55	5·50	·60	·09	·79
	100·00	100·00	100·00	100·00	100·00
* Equal to tribasic phosphate of lime	70·82	66·58	77·05	47·52	49·56
† Containing nitrogen	..	..	·38	..	·26
Equal to ammonia			·46		·32

The surface layer of the guano is powdery and of a brown colour, and exhibits numerous fibres of roots and similar vegetable remains. In the lower layers are found a good many lumps, varying in hardness, size, and texture. The strata resting immediately upon the coral-rock are somewhat crystalline, and contain from 20 to 25 per cent. of sulphate of lime.

If worked too near the rock, the guano is liable to get contaminated with carbonate of lime, of which substance the coral rocks almost entirely consist.

The chemical character of Baker Island guano will be readily recognised by the following analyses, made in my laboratory a few years ago:—

COMPOSITION OF BAKER ISLAND GUANO.

	No. 1.	No. 2.	No. 3.
Moisture	12·05	4·71	19·16
*Organic matter	6·25	6·17	8·61
†Phosphoric acid	32·32	39·44	29·55
Lime	42·34	43·01	34·69
‡Carbonic acid	2·99	·27	7·26
Magnesia	·71	2·32	
Oxide of iron	·14	·96	
Alumina	·09		
Sulphuric acid	1·19		
Alkalies, and loss in analysis	1·78	2·33	
Insoluble siliceous matter	·14	·79	·73
	100·00	100·00	100·00
* Containing nitrogen	..	·34	·72
Equal to ammonia	..	·41	·87
† Equal to tribasic phosphate of lime ..	70·55	86·11	64·51
‡ Equal to carbonate of lime	6·79	·61	..

Baker Island guano seldom contains any ammonia, the nitrogen shown in two of the above analyses being present in the shape of organic matter. It varies much in quality. The sample No. 1 may be regarded as a good average one, No. 2 as unusually rich, and No. 3 as poor.

Howland Island Guano.—Howland Island, another West Indian coral island, is situated in 0° 49′ N. latitude and 176° 52′ W. longitude. Its greatest length from north to south is 2783 yards, its breadth 825 yards, and its elevation above the level of the sea 22 feet at low water, and about 12 feet at high water.

The guano deposits on Howland Island are very similar in composition and physical characters to those on Baker Island, as will be seen by the subjoined analyses:—

COMPOSITION OF THREE SAMPLES OF HOWLAND ISLAND GUANO.

	No. 1.	**No. 2.**	**No. 3.**
Moisture	10·01	15·31	8·95
Organic matter	5·72	7·26	6·15
*Phosphoric acid	34·21	33·35	34·80
Lime	43·03	39·36	43·26
Magnesia, sulphuric acid, alkaline salts, &c.	6·83	4·56	6·54
Insoluble siliceous matter	20	·16	·30
	100·00	100·00	100·00
* Equal to tribasic phosphate of lime ..	74·68	72·80	75·97

Jarvis Island Guano.—Jarvis Island, situated in 0° 22′ N. latitude and 159° 55′ W. longitude, is 1487 yards long and 1870 yards broad, and about 30 feet above the level of the sea.

Like Baker and Howland Islands, it is surrounded by coral reefs, which much impede the shipping of the guano.

Composition of Jarvis Island Guano.

Moisture	11·27
Organic matter	9·93
*Phosphoric acid	23·88
Lime	37·18
†Carbonic acid	5·02
Magnesia, sulphuric acid, &c.	12·63
Insoluble siliceous matter	·09
	100·00
* Equal to tribasic phosphate of lime ..	52·13
† Equal to carbonate of lime	11·41

Jarvis Island guano is similar in appearance to Baker and Howland Island guanos. The better deposits have nearly all been carried away, and the cargoes which now reach England are generally poor in phosphates and contaminated with a good deal of carbonate and sulphate of lime, as will be seen by the analysis on the preceding page which I made this spring of a cargo of such inferior Jarvis Island guano.

Crust guano of a superior character is also found on Jarvis Island.

Birds' Island Guano.—This guano occurs on a small coral island in the South Pacific. According to the accounts of the explorers, the guano occurs on the island partly in the shape of a light-brown or yellowish powder, and partly in the shape of soft rock-like looking crusts.

As far as I know, no Birds' Island guano has been imported into England for some years past. The specimen in my collection is a light-coloured, friable, and porous stone-like mass, not unlike lime-tufa in appearance. Submitted to partial analysis its general composition was ascertained to be as follows :—

Composition of Birds' Island Guano.

Moisture	6·92
Organic matter	4·80
Phosphate of lime (tribasic phosphate)	80·44
Carbonate of lime, magnesia, &c.	6·38
Alkaline salts	1·34
Silica	·12
	100·00

Shaw's Island and Flint Island Guanos.—Shaw's Island lies in the South Pacific not far from Malden Island. Where Flint Island is, I have not been able to ascertain. Judging from its composition it probably belongs to the same group of coral islands in the South Pacific from which we obtain the most valuable phosphatic guanos.

Only one sample of Shaw's Island and another of Flint Island guano have passed through my hands. Their composition I found as follows :—

	Shaw's Island Guano.	Flint Island Guano.
Moisture and organic matter	13·67	13·26
*Phosphoric acid	34·69	37·13
Lime	43·26	43·43
Magnesia, sulphuric acid, alkaline salts, &c.	7·53	5·99
Insoluble siliceous matter	·85	·19
	100·00	100·00
* Equal to tribasic phosphate of lime	75·73	81·05

Both deposits contain a high percentage of phosphate of lime, which mainly regulates the commercial value of these and similar guanos.

Malden Island Guano.—Malden Island is another coral island in the South Pacific, upon which occur guano deposits of a considerable extent. The guano has a light-brown colour, and generally contains fragments of coral; consequently its analysis always shows some carbonate of lime, which forms no part of the guano itself. It is a fine powdery phosphatic manure, and no doubt has been produced from the excrements of sea-birds, large numbers of which inhabit the island.

The composition of Malden Island guano varies according to the care which is taken in excluding fragments of the coral rock upon which the deposit occurs. The following analyses show the chemical character of recent importations.

COMPOSITION OF MALDEN ISLAND GUANO.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Moisture	4·78	5·39	4·78	4·56	9·90	5·18
Organic matter and Water of Combination	5·18	5·79	5·18	4·04	6·11	7·72
*Phosphoric acid	34·75	33·52	34·75	35·32	31·36	33·39
Lime	46·22	45·16	46·22	46·99	42·33	45·67
†Carbonic acid	3·65	4·05	3·65	2·85	4·69	4·79
Magnesia, sulphuric acid, and alkaline salts	5·32	6·05	5·32	6·15	5·47	3·11
Insoluble siliceous matter ..	·10	·04	·10	·09	·14	·14
	100·00	100·00	100·00	100·00	100·00	100·00
* Equal to tribasic phosphate of lime	75·86	73·17	75·86	77·10	68·46	72·89
† Equal to carbonate of lime	8·29	9·20	8·29	6·47	10·66	10·88

Enderbury Guano.—Enderbury Island lies south of Malden Island in the South Pacific, and, like Baker and Howland Islands, is a raised coral rock of limited extent, upon which the excrements of numberless birds, deprived of their soluble, organic, and saline constituents, have given rise to phosphatic deposits.

The guano on Enderbury Island has no smell, and is of a light-brown or yellowish colour. It occurs partly as a fine powder, and partly in the shape of brown-coloured crusts, which by the uninitiated might be mistaken for worthless stony masses.

A sample of powdery Enderbury guano, analysed by me two years ago, had the following composition :—

Composition of Enderbury Powdery Guano.

Moisture	8·76
*Organic matter	8·81
†Phosphoric acid	28·74
Lime	40·76
‡Carbonic acid	7·26
Magnesia, alkaline salts, &c.	5·58
Silica	·09
	100·00
* Containing nitrogen	·38
Equal to ammonia	·46
† Equal to tribasic phosphate of lime	62·74
‡ Equal to carbonate of lime	16·50

The sample contained 16½ per cent. of carbonate of lime and only 62¾ per cent. of phosphate of lime. It was almost completely soluble in acid, and no doubt the guano would have turned out richer in phosphates if more care had been taken to collect it on a spot where the deposit was less contaminated with fragments of coral than the sample analysed by me.

Two samples of crust guano from the same island I found much richer in phosphoric acid than the powdery deposit, as will be seen by the following figures:—

COMPOSITION OF TWO SAMPLES OF ENDERBURY CRUST GUANO.

	No. 1.	No. 2.
Moisture	8·33	11·67
Organic matter	6·45	
*Phosphoric acid	37·79	38·67
Lime	41·96	42·83
†Carbonic acid	1·46	6·65
Magnesia, alkaline, salts, &c.	3·95	
Silica	·06	·18
	100·00	100·00
* Equal to tribasic phosphate of lime	82·49	84·42
† Equal to carbonate of lime	3·31	Not determined.

Starbuck Island Guano.—Starbuck Island is another of the small guano islands in the South Pacific. It lies south of Malden Island, and furnishes both powdery and crust guano, which in appearance or composition are scarcely distinguishable from similar deposits occurring on Baker or Jarvis Island. The following is an analysis of a good sample of powdery Starbuck Island guano:—

Composition of Starbuck Island Guano.

Moisture	11·56
*Organic matter	7·25
†Phosphoric acid	33·61
Lime	41·04
Magnesia	1·16
Sulphuric acid	·88
‡Carbonic acid	1·05
Alkaline salts	3·43
Silica	·02
	100·00
* Containing nitrogen	·39
Equal to ammonia	·47
† Equal to tribasic phosphate of lime	73·67
‡ Equal to carbonate of lime	2·38

The richest crust guano ever analysed by me came from Starbuck Island. Two samples had the subjoined composition:—

COMPOSITION OF TWO SAMPLES OF STARBUCK ISLAND CRUST GUANO.

	No. 1.	No. 2.
Moisture and organic matter	8·75	10·01
*Phosphoric acid	45·57	40·12
Lime	40·94	44·96
Magnesia	·64	4·87
†Sulphuric acid	3·56	
Alkalies and loss in analysis	·47	
Silica	·07	·04
	100·00	100.00
* Equal to tribasic phosphate of lime	99·48	87·58
† Equal to sulphate of lime	6·05	..

If the phosphoric acid found in No. 1 were combined with lime to form tribasic phosphate it would correspond to 99·48 per cent. of that compound, but as the proportion of lime in that percentage amounts to 53·91 per cent., and only 40·94 per cent. of lime were actually found, and a portion of the lime moreover is united with sulphuric acid as sulphate of lime, it follows that these crusts consist of a less basic phosphate than the ordinary bone-phosphate. When due allowance is made for the lime which is combined with sulphuric acid, the calculation of the results of the analysis shows that nearly the whole of the lime found is united with phosphoric acid as bibasic phosphate; that is, a compound consisting of two equivalents of lime and one equivalent of phosphoric acid. This circumstance, as pointed out in a former part of this paper, renders Starbuck crust guano extremely valuable for the production of concentrated artificial manures, rich in soluble phosphate of lime.

Although most of the phosphatic guanos to which reference has been made produce a decidedly beneficial effect when they are applied to root-crops at the rate of 4 to 5 cwts. per acre, it is nevertheless advisable for reasons of economy to treat them with sulphuric acid, and thereby to render the phosphates more soluble than they exist in the phosphatic guanos in their natural condition.

11, *Salisbury Square, Fleet Street, E.C.,*
July 1876.

XVII.—*Longhorn Cattle: their History and Peculiarities.*

By J. Nevill Fitt.

The present may be literally called an age of revivals; but I doubt whether, amidst all the revivalism going on, a more useful regeneration, nationally speaking, has taken place, than the bringing to the front once more this useful though long-neglected breed of cattle. A hundred years ago Longhorns occupied a somewhat analogous position in public favour to that held by the Shorthorn now. It is true we have no record that they were ever sold for thousands of pounds per head, but money was then by no means so plentiful or so cheap as it is now, neither was it then the fashion to go to a vast outlay on fancy articles. But the old Longhorn men obtained hundreds for the choicest specimens of their herds; and they were looked upon at that time as the most profitable, both as beef-producers and cheese-makers, which the farmer could stock his pastures with. Their reign, however, was not a long one, for truly it may be said of them,

> "Moons wane, and races wither to the tomb,"

and the two first decades of the present century saw them well-nigh superseded, and their places filled by the then rising Shorthorns. Well might it have been predicted when Bates, the Collings, and other noted breeders, arose with giant-like energy to take the new comers in hand, and expended time, skill, and capital on their behalf, that the curly coats would have a tough fight to maintain their supremacy. But the citadel was doomed to fall, from weakness within rather than assaults from without; and it was the want of due knowledge in the science of breeding, amongst those who held them, rather than any preponderating superiority on the part of their rivals, that caused the gradual displacement of the Longhorn from our pastures and steadings. In fact, the Longhorn breeders attempted too much; and the breed may veritably be said to have been killed with kindness. They sought for over-refinement, and forgot that it is much more easy to lose than to regain hardy qualities and big bone, which any breed must have to pay in the hands of tenant-farmers generally. Qualities for which the Longhorn had for years been especially famous were ignored, and others of an exotic character endeavoured to be implanted on him,—such as must eventually prove the ruin of any breed in which they are perpetuated, without some counteracting influence. Those men who first took in hand the breed in its rough state, and made it famous, gradually passed away. Others arose without their skill, who, not content to let well alone, in trying to gild refined gold, overshot their mark, and produced misshapen animals, delicate in constitution, and, worse than all, uncertain breeders. Hence their gradual decay and comparative scarcity, so that "The Druid," a few years ago, writing "When the Durham ox began his six years of caravan life, the fate of the Longhorn was sealed,"* shot very near the mark, though he cannot be quite said to have hit the bull's-eye. In fact there were a few men who, knowing the intrinsic merits of the breed, stuck to them through good report and evil report, and gaining experience by the failures of their predecessors, avoided the shoals and quicksands on which others had been wrecked. Patiently biding their time, they have held on long enough to see their favourites once more come into well-deserved esteem, and take their place with our Shorthorns, Herefords, Devons, and so forth. To trace the Longhorn through the various stages of fortune which have awaited him is the purpose of the present Paper; and now that he is once more emerging from undeserved obscurity, after having passed through what may be called the dark ages of the breed, to enter on a new state of usefulness, I trust that his history may be found neither unimportant nor uninteresting.

With regard to his derivation, little is known. I have seen it asserted that, like his rival, the Shorthorn, he first came from Yorkshire, and that the district of Craven was the cradle of the race. But I also find that, at a very early date in our history, he was spread, widely spread, over what are now generally known as "the grazing districts;" and I feel more inclined to look on Craven as a part where perchance some superior animals were bred (perhaps from the effect of soil and climate, combined with greater skill), and for their superiority introduced to other districts with the view of effecting improvements in the coarser herds, rather than as the spot from which the whole race of Longhorns first sprung.

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* 'Mark Lane Express' of Jan. 7th, 1867.

Wherever he may have originally come from, I can only trace the history of the Longhorn with any accuracy from the northern parts of Leicestershire, and the adjacent county of Derbyshire. He seems to have been first brought to perfection on the borders of the wild district known as Charnwood Forest, which, at the time these cattle first came into notoriety, was probably as wild and uncultivated as any spot to be found in England. Right well do the picturesque cattle match with its sylvan beauty, and I am almost tempted at times to think that the early improvers of the breed must have taken them in hand, as much with an eye to general fitness of things as for the sake of beef and cheese. However, that could scarcely be, for it is not likely that, pioneers as they were in the road of agricultural improvements, these practical hard-headed yeomen had any very pronounced æsthetic taste, or that they were as much influenced by the appearance as the utility of their cattle. Nevertheless, it is a singular coincidence that perhaps the only English breed of cattle which would come well into the foreground of a wild rugged landscape should have found its home in such a locality. The earliest name I have met with in connection with improvements in the breed is that of Sir Thomas Gresley, of Drakelow House, Burton, "who took such delight in keeping a dairy of cows similar in colour and shape," as early as 1720, and consequently years before Bakewell became a name of note amongst Longhorn breeders. To Sir Thomas most of those who wished to improve their herds had recourse, and the generality of Longhorn cattle of note trace back to him. A blacksmith, Welby by name, who lived at Linton, just on the borders of Derbyshire and Leicestershire, appears to have laboured most successfully for the improvement of the breed on the lines laid down by Sir Thomas, until disease came and swept the unfortunate man's herd entirely away. Webster of Canley, near Coventry, next comes on the scene. He used the Drakelow stock, and crossed them with bulls from Cumberland and Westmoreland, which counties must have had pretty good herds at that early day; and, strange to say, of late years I have found some of the best breeders taking exactly a similar course, and going to those districts to procure bulls. Webster's best bull was "Bloxidge," who was the sire of some very remarkable stock. Bakewell laid the foundation of his herd with a couple of Canley heifers and, like Webster, a Westmoreland bull, so here we get the line direct to Sir Thomas Gresley's herd, and from him the blood was imparted to nearly all the herds of the country.

All who take an interest in agriculture must regret that Bakewell left no records behind him as to the methods he pursued in the improvement of his cattle and sheep; in fact, I should have liked to learn more concerning the man and his doings altogether, for he was certainly no ordinary person, and would probably have made his mark in any age in which he chanced to live. Such records as are extant concerning him tell us that he associated with all the chief men of his day; was given to almost princely hospitality, whereby he so impaired his fortune, that he was obliged to make over his farm to another, notwithstanding the immense prices at which he both sold and let sheep and cattle. There is no doubt that his ideas of farming were quite unique and original, and very much in advance of the age in which he lived. When we read of his driving only two horses in a plough, of his utilising a stream which ran through the farm to carry his turnips from where they were grown to the feeding or storing places, thus washing them in the transit,—and learn how even the most trivial things were turned to account,—we feel that he was not an improver of cattle and nothing more, but a man much given to discarding the beaten paths of life, and chalking out fresh lines for himself. We also must regret that a life of such usefulness to his countrymen should have ended in less affluent circumstances than his great talents and industry deserved. For three different kinds of stock was he celebrated, cattle, sheep, and horses; the two former remain as a lasting memorial to him, but the latter, said to have been of surpassing excellence, and procured from Flanders, are, I fear, lost; and the great size and activity for which they were celebrated have but poor representatives in the hairy-legged clumsy giants for which the Midland Counties are famous. I believe he sent one of his horses as a present to George III. His cattle were soon celebrated, and the bull "Twopenny" appears to have gone the rounds like a judge on circuit, for at one time I find him at Upton, in Leicestershire, and at another at Rollright, in Oxfordshire. Though a great letter of stallions, bulls, and rams, the Dishley Squire appears always to have had a great aversion to sell; and perhaps we may not wonder at it when he could let one ram for a thousand guineas the season. Judging by the turn affairs afterwards took in regard to Longhorn cattle, I should say that he sought for quality rather than size, and instituted the liking for small bone, which a little later was carried to such an excess, that it may be assigned as one of the causes which destroyed the popularity of the breed. It is known that he boasted of having given them a great increase of meat in the roasting parts. He bred very much in-and-in, and after his first Westmoreland venture, did not go from home for sires. Though he improved the feeding qualities, he lost some of the milking ones. I have travelled somewhat, as it were, out of my road to dwell on the character of Bakewell, because no history of Longhorns would be complete without a notice of what I may justly term their great high priest, and also because he stands out in such bold relief from the yeomen of his day. To read of his doings, one might well fancy that he had been born in the age of the steam-engine and electric telegraph. Not long ago I chanced to be in the neighbourhood of Dishley, and turned aside to see the grave of the man who had done so much for the peaceful industry of his country. I found it in the little, unused, and dilapidated church close to the Grange, where his princely hospitality was dispensed, now only a common dovecote and building-place for the fowls of the air.

Bakewell's cattle have been kept in remembrance chiefly by the bull "Twopenny" before mentioned, and the oft-recorded fact of his cow "Comely," the founder of some of his choicest strains, having 4 inches of fat on the sirloin when killed at the great age of twenty-six years.

Coeval with, if not anterior to, Bakewell's celebrity as a breeder, was the foundation of the Upton herd by Mr. Chapman, which, when it was dispersed in 1873, was supposed to be the oldest herd of Longhorns in the kingdom; and I believe I may say still is, as Mr. R. H. Chapman continues a few of the sort on his farm at St. Asaph, North Wales. In this early day it had attained such excellence that Bakewell himself pronounced it as good as any herd in the kingdom, and they soon had a dip into his blood, having hired "Twopenny" for a time. Nearer neighbours to him were Buckley, who boasted that the bone of the leg of mutton on one of his improved Leicesters was no bigger than the stem of a tobacco pipe, and those who also lived on the north side of the Forest were Stone and Farrow; on the south were Knowles, Astley, and Paget, besides Chapman. Perhaps the greatest amount of notoriety, after Bakewell's, was gained by Mr. Fowler, of Rollright, in Oxfordshire, who commenced like him with Canley blood, and hired "Twopenny." He, however, set the seal to the fortune of his herd when he purchased "D," a grandson of "Twopenny," and a very inbred bull, from Dishley. This bull was the sire of "Shakespeare," who was sold at Mr. Paget's sale at Ibstock, in November, 1793, for 400 guineas. Like Bakewell, Fowler stuck much to his own sort, and in his later days, at any rate, did not go from home for his sires. Another similarity to Bakewell was his aversion to selling his cattle, and no offer, it mattered not how handsome, made for his cows or heifers, so long as they continued prolific, could his friends prevail on him to accept. He always regretted the sale of three "Twopenny" heifers to Mr. Grey, of Toddington, and would have given the price of the three to get one of them, "The Painted Lady," back again, but the purchaser knew too well the value of what he had bought, and the offer was made in vain. Mr. Fowler also refused the then large price of a thousand guineas for three cows and a bull. At length, however, the time came when the herd was to be dispersed, an average of 80*l.* per head was realised, and eight cows made 151 guineas each, while the bulls sold as follows: "Garrick," by "Shakespeare," 215*l.* 5*s.*; "Sultan," 220*l.* 10*s.*; "Washington," 220*l.* 5*s.*; "Young Twopenny," 68*l.* 5*s.*; and "Young Garrick," 49*l.* 7*s.* Amongst the cows, "Young Brindled Beauty," 2 years old, was sold for 66*l.* 3*s.*; and "Young Beauty," a yearling, at 34*l.* 13*s.*; while "Brindled Beauty" herself went to the same purchaser at the strong price of 273*l.* Another cow, the dam of "Washington," made 194*l.* 5*s.*; and "Nell's Daughter," 136*l.* "Shakespeare" was let for two seasons to Mr. Prinsep at 80*l.* a season; and that he was a very superior bull may be gathered from the following description of him by Marshall, in his 'Economy of the Midland Counties,' published 1790: "His head, chap, and neck, remarkably fine and clean; his chest extraordinary deep; his brisket down to the knees; his chine thin, and rising above the shoulder points, leaving a hollow on each side behind them; his loin narrow at the chine, but remarkably wide at the hips, which protruded in a singular manner; his quarters long in reality, but appearing short, occasioned by a singular formation of the rump. At first sight it appears as if the tail, which stands forward, had been severed from the vertebræ by the chop of a cleaver, one of the vertebræ extracted, and the tail forced up to make good the joint, an appearance which, on examining, is occasioned by some remarkable wreaths of fat formed round the setting-on of the tail, a circumstance which, in a picture, would be deemed a deformity, but as a point is in the highest estimation; the round bones snug, but the thighs rather full and remarkably let down; the legs short, and their bone fine; the carcase throughout (the chine excepted), large, roomy, deep, and well-spread." This bull was by "D," out of a daughter of "Twopenny," so of course very much inbred to that strain.

Mr. Paget, of Ibstock, at whose sale "Shakespeare" made 400 guineas, appears to have been a very noted breeder of this period, but unfortunately there is no record of his doings, save that he charged 25 guineas a cow for the service of "Shakespeare." But Mr. Prinsep, who leased the same bull for a couple of years, realised at his sale 303 guineas for a calf, and 620 for a cow; so that he stands quite in the first rank as regards returns, and I doubt if even the Dishley or Rollright books showed higher prices than these. Pitt, in his agricultural report of Derbyshire, May 20th, 1794, says, "I viewed the stock of Mr. Prinsep, of Croxall, and I shall just observe, that they are of a Longhorn breed; and by a long attention, have been brought to a high degree of superiority: large, thick, heavy, and well made, with a pretty good show for milking; and such a disposition to fatten, that Mr. Prinsep observes the young stock are obliged to be almost starved by short pasturage, otherwise they make fat, and never stand the bull. Cows give upon an average about 8 quarts of milk each, which their owner thinks equal, from its superior quality, to a much greater quantity from inferior breeds. Mr. Prinsep's bull, named 'Bright,' which always has been, and invariably will be, kept for his own stock, is a majestic, noble animal; large, heavy in the valuable parts, with the least imaginable proportions of offal, with a skin handling soft and sleek. This majestic animal is so gentle and docile, that three or four persons at once may handle him without the least sign of ferocity, or even notice on his part. 'Brighteye,' the son of 'Bright,' now 3 years old, is a most beautiful and complete animal; and it requires a person of superior skill to that which I possess to find a single fault with him."

What a pity it is that Pitt did not think it worth his while to give us the pedigrees of these bulls, so that we might have traced the strains of blood! As Mr. Prinsep hired "Shakespeare," I apprehend that there is little doubt that they came of the celebrated "Twopenny" family. On p. 466 is given a portrait of one of them by Ward,[*] the celebrated animal painter of that period; and as no doubt it is a truthful likeness, as well as a very valuable picture, I can only come to the conclusion that those who think the Longhorn cattle of those days were superior to those now to be seen, are in error. I have met with several bulls in recent years to which "Bright," or "Brighteye," whichever it may be that was painted, certainly could not, to use a vulgar phrase, "hold a candle." In fact, I incline to the belief that in the case of many of these ancient worthies distance lends enchantment to the view. We learn from another authority, that a dozen years or so later, Mr. Prinsep had a dairy of milking-cows, all in such condition that they were really fit for the butcher; and that a 7-year-old cow, which was killed, turned the scale dead weight at 104 stone,

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[*] I must acknowledge the courtesy of the proprietor and editor of 'The Agricultural Gazette,' through whose kindness the portraits of the bull of the last century, of the two steers (p. 478), and of the cow (Fig. 4, p. 484), have been laid before my readers.

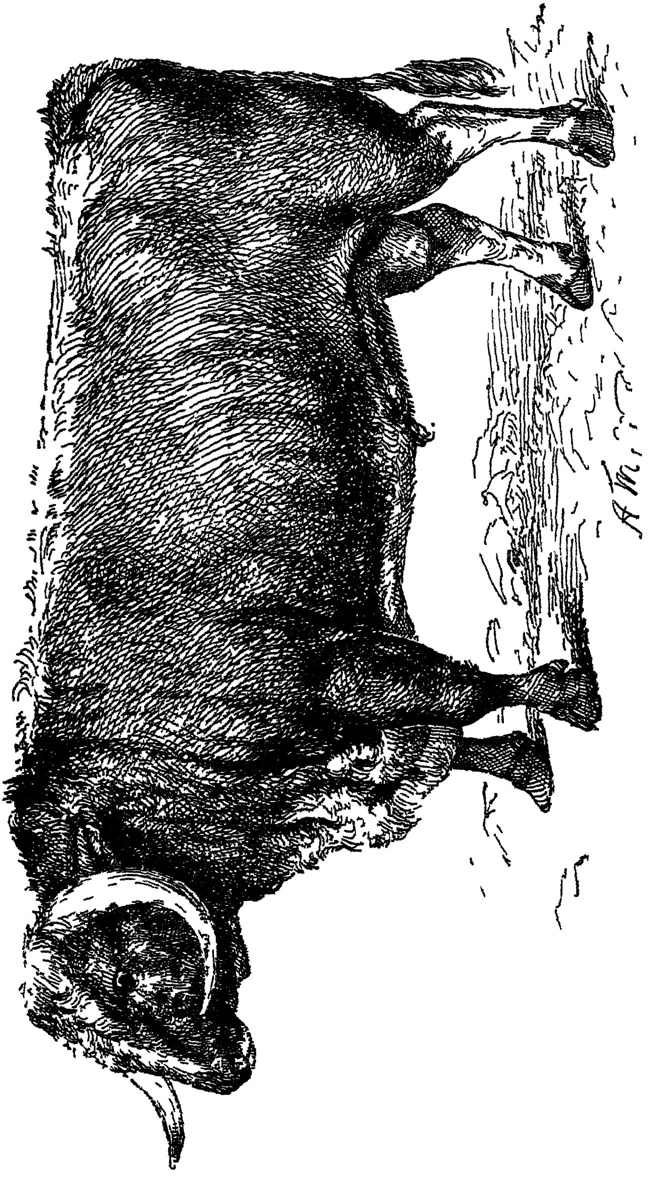


Fig. 1. *Old Longhorn Bull of last Century.*

14 lbs. to the stone, or 18 score 4 lbs. per quarter. Another noted breeder of early days was Mr. Richard Astley, who lived at Odstone Hall, Market Bosworth, Leicestershire, which property had been in his family for some generations, and where at one time resided John Bradshaw, who was President of the court by which Charles I. was tried. Mr. Astley was a large exporter of Longhorns to Ireland, where several of his bulls were in great favour; but he will perhaps be best remembered as the owner of the celebrated cow which was exhibited all over the country in a van. No doubt she was a very first-class animal, and it is a pity that her pedigree, as well as that of other of Mr. Astley's celebrities, has not been preserved. This, perhaps, is the more wonderful, as Mr. Astley was for many years a member of the Smithfield Club, in fact, from the time of its commencement until 1832, when he was the father of the club. He was a large buyer at the Rollright sale, and dipped deeply into the "Shakespeare" blood; but farther than that I have been able to obtain no record of how his herd was bred. The Knowles's, Thomas and William, of Nailstone, near neighbours, were partners with him in the Rollright purchases; and Mr. Green, of Odstone Hall, was a fellow-breeder. Amongst others distinguished as Longhorn men of that date were Mr. Munday, of Market-Eaton, whose herd gave a curious example of the difference, as regards milking properties, to be found in cows of the same breed, and near relations. He had two, own sisters, with only a year's difference in the age. One, named "Thistle," made her 17 lbs. of butter a week; the other, named "Truelove," stopped short at 5. As may be anticipated, one was always very low in condition, and the other fit for the butcher. Mr. Munday kept a large herd in his park.

Mr. Cox, of Braisford, was owner of a herd both large and select, and was also breeder of the famous bull "Tippoo." Mr. Smith, of Foremark Park, was also a large owner; but not like most of his neighbours, a cheese-maker; nor was Mr. Harvey, who found rearing the calves with their dams more profitable. Besides these, there were Mr. Francis Benchfield, of Alton Hall; Mr. Robert Leigh, of Borough Fields; and Mr. Greaves, of Ingleby, all well known for the excellence of their cattle.

Mr. Thomas Satchwell, of Heinfield, near Birmingham, has a herd now that must have been founded at a very early date. He used bulls from Wroxall and Rollright, and also a bull by Mr. Horton's "Old Conqueror," the first-prize animal at the Oxford Show in 1839. Mr. Setchwell was also a large prize-taker at other Shows. The Wroxall herd dates back at least to the middle of the last century. The uncle of the present Mr. Nicholas Taverner had a sale at Fenny Drayton in 1794. He had secured the celebrated Rollright bull "Washington" from Michael Buckley, who three years before had given 215*l.* 15*s.* for him at Fowler's sale; and a great deal of stock by him then came to the hammer. From the time of Mr. Prinsep's sale in 1811, when an average of 61 guineas was reached for 60 lots of all ages, we learn little more of the private history of Longhorns until more recent years. The next incident of any note unconnected with the showyard is the sale by Mr. Brown, to the Hon. M. W. B. Nugent, of Higham Grange, near Hinckley, brother to the Earl of Westmeath, of the following cattle: The "Shakespeare" bull, 127*l.*; "Young Garrick" bull, 77*l.*; Prinsep cow, 92*l.* 15*s.*; Prinsep stirk, 42*l.* 17*s.*; "Dumplin" stirk, 42*l.* 17*s.*; "Cherry" cow, 100*l.*: an average of 82*l.* 8*s.* 2*d.* for the six in April 1841. Mr. Brown, whose herd was founded very early in the present century, won seven 10*l.* silver cups, and three 5*l.* cups, at the old Staffordshire General Agricultural Society's Show, held at Lichfield about 55 years ago, with his Longhorns, when competing with Herefords, Shorthorns, and Devons, the different classes often numbering as many as 20 entries in each class. This was from about the year 1813 to 1820; and prizes were also taken by this herd at the Royal Shows held at Derby and Shrewsbury. This Mr. Brown used a bull named "Washington," by Mr. Meek's "Washington," out of Mr. Prinsep's "Brindled Beauty," from 1808 to 1812. It is recorded, that about the latter year the noted Hereford breeder, Mr. J. Price, challenged the Longhorn men to an exhibition of 20 cows, for the sum of 100*l.* a-side, to be decided at the Lichfield Agricultural Society's Show. Mr. Meek accepted the challenge, and the verdict was given in favour of the Herefords. Lichfield appears to have been a great centre for Longhorns at this time, as it is within a few miles of Croxall, made so famous by the name of Prinsep. Mr. Brown's son turned his attention more to dairy than Show stock, and a sale of his herd during the present year I shall have to notice further on.

There is one other Longhorn hero I must, however, revert to, and that is the bull "Tiger," of whom tradition avers that he was sold for the enormous sum of 700 guineas. Who bred him, when or where he was calved, or at what period, I have never been able to learn; which is all the more strange as, to make such a figure, he must not only have been a very good bull himself, but must also have had a distinguished ancestry, as it is not to be presumed that people in those days threw their money away on cattle of inferior blood more than they do at present. But a Longhorn Coates was sadly wanted; and though in some herds the genealogical tree has been pretty correctly kept, in others it has been either altogether neglected or lost.

I have said that there was little to be learnt of the private history of these cattle from the time of Mr. Prinsep's sale in 1811 until recent years; and true it is that they appeared to be neglected and dying out. The Shorthorn then was becoming the fashion, and a heavy cloud appeared to hang on the Longhorn horizon; however, the sale of Mr. Brown's beasts, above recorded, will serve to show that in some few hands, at least, they were cherished and held in high esteem, and we occasionally drop on them in showyard annals, not regularly, as is the case with most breeds, but occasionally here and there, sometimes an odd specimen or two to compete with other breeds, or in extra classes—sometimes in a small class amongst themselves; and it is only fair to them to say that, whenever they have met their rivals in the lists, they have quite held their own.

As might naturally be expected, we find them most plentiful in the early part of the century, especially in the first decade and half of the next, during which time they figured prominently in the Shows of the Smithfield Club, in the formation of which Longhorn men were quite as prominent as their brother agriculturists—Mr. J. Wilkes, of Measham, near Odstone Hall, having been the original proposer of it at the meeting held in London in December, 1798. His neighbour, Mr. Richard Astley, was found to support him, in conjunction with such men as Arthur Young, John Ellman, and others. Three years later we find the Longhorns were in the winning list with Herefords and Sussex cattle. A few more years and they took an equal amount of money with Herefords, Shorthorns, and Sussex; and, strange as it may seem to modern ears, both Shorthorns and Longhorns had to earn their certificate of merit as workers on the farm to become eligible for showyard honours. In a recent article published on Longhorns, in the 'Agricultural Gazette,' March 27th, 1876, are the following statistics as to their successes at Smithfield:—"1800, one cow, 8 guineas; 1809, one ox, 20 guineas; 1814, two oxen, 45 guineas; 1815, one ox, 15 guineas; 1826, one cow, 10 guineas; 1839, one cow, 20 guineas; 1840, one cow, 5 guineas; 1847, one cow, 15 guineas." Thus it will be seen that the Longhorns were in this period awarded 153*l.* 3*s.* in competing with all other breeds. The Longhorn has not generally been regarded as a beast that stood crossing with impunity, neither I believe does he, where it is intended to breed back to the original strain, as his peculiar characteristics will not admit of assimilation with other breeds; but that, as far as meat-producing qualities are concerned, he is calculated to form a heavy and good hybrid, is proved by the Earl of Radnor's crossbred heifer between the Longhorn and Hereford, which at the Smithfield Club Show in 1847, at 2 years and 8 months old, was awarded the gold medal as the best cow or heifer of any breed in the yard. Of Longhorns, as I have said before, the appearance in stock showyards has been of a more limited nature than that of most breeds; as since shows for stock beasts have attained their present importance in the agricultural world, the Longhorn has been in the oblivion from which he is only now just emerging to take his proper place amongst his compeers.

To trace the doings of Longhorns in local showyards would occupy more space than I have at my disposal; but having shown the position held by them at the great fat-stock show, it is only right that I should advert to their doings at the Shows held by the Royal Agricultural Society of England. As a rule no separate class has been provided for this breed, and it has generally been their lot to meet opponents of any other breed than Shorthorn, Devon, or Hereford; and, as a rule, they have been successful against all comers.

At the Society's first Show they were not represented, or if any were shown they were not of sufficient merit to get in the list of prizes; and we first come on them at Bristol in 1842, when, in the fourth class for "any breed or cross other than Shorthorn, Devon, or Hereford," the Hon. M. W. Bellew Nugent, of Higham Grange, gained a prize of 20*l.* for his 2 years and 3 months old Longhorn bull, bred by Mr. W. Horton, of Sherbourne, Warwickshire. Mr. Thomas Joseph Pensman, of Leigh, near Tewkesbury, also won a 15*l.* prize for a 2 years and 4 months in-calf heifer, and the Hon. M. W. B. Nugent a 10*l.* prize for his 1 year and 3 months heifer. As might naturally be expected, they came to the front again in 1843, when Derby (situated in the district which may be termed the stronghold of the breed) was fixed upon as the site of the Show, and Mr. James Hextall, of Snibston, near Ashby-de-la-Zouch, carried off the 30*l.* with his 3 years and 6 months old bull, bred by Mr. John Dean, of Ibstock. Mr. William Daniel, of Burton-upon-Trent, also took 15*l.* for his 3 years and 5 months bull, bred by himself; and a prize for the best bull of any breed, other than Shorthorn, Devon, or Hereford, was withheld for want of sufficient merit; so I fear we must conclude they were not, after all, a very grand lot. Amongst the cows, Mr. Edward Pratt, of Caldwell, Burton-upon-Trent, won 15*l.* for his 9 years and 3 months cow, bred by Mr. J. Minion, of Statfold, near Tamworth; and we then come, for the first time, on the Duke of Buckingham's name as a successful exhibitor of this stock, he having won 15*l.* with a homebred 2 years and 11 months old in-calf heifer.

One would scarcely have looked for specimens of the breed so far south as Southampton, where the next Show was held in 1844;

but Mr. William Brine, of Tolpuddle, near Dorchester, won, beating a Sussex and a Hereford-Shorthorn cross bull with his 4 years and 5 months old Longhorn, proving that the breed was known and appreciated even in the Southern counties. The Hon. M. W. B. Nugent was also again well to the fore, winning 15*l.* with a 10-year-old cow, bred by Sir Thomas Ball, of Swinford Lodge, Southam; while Stowe again bore off the ribbon with a homebred heifer, 2 years and 10 months old.

The Hon. M. W. B. Nugent had a wonderful time of it at Shrewsbury the next year, 1845, where he won 20*l.* for a 4 years and 2 months old bull, bred by Mr. T. Slingsby, of Foleshall, near Coventry; 15*l.* for a 21-year-old cow (?), bred by Mr. W. Gibbs, of Henley-in-Arden; 10*l.* for a 2 years and 10 months old heifer, from the same breeder; and 10*l.* for a 1 year and 9 months old heifer, bred by himself. At the same meeting Mr. John Lees Brown, of Farewell, near Lichfield, also won 10*l.* for a 3 years and 6 months old bull, bred by himself.

At Newcastle-upon-Tyne, in 1846, the Hon. M. W. B. Nugent was again put first in the open class, and won 15*l.* with a 5 years old bull, bred by Mr. J. Twycross, of Canley, near Coventry; a Galloway bull being second to him. He also won 15*l.* with a 1 year and 4 months old bull, bred by himself; 15*l.* for a 3 years and 10 months cow; 10*l.* for a 2 years and 7 months in-calf heifer; and 10*l.* for a year and 6 months heifer; all of his own breeding, taking what may be called a regular benefit.

At Northampton, in 1847, although it is but a short distance, comparatively speaking, from the Longhorn country, there was a marked falling off, and the only animals of this breed to be found in the list are a 6 years and 4 months cow, in-milk, of Mr. William Umbers, of Wappenby, near Leamington, bred by himself, who took a prize of 15*l.*; and a 2 years 11 months, and 1 year 8 months old heifer, both exhibited and bred by the Duke of Buckingham, each of which won a prize of 10*l.* value. There was also a falling off at York in 1848, when a Sussex bull won in the open class; and the only Longhorns in the list are a 2 years and 8 months old in-calf heifer, the property of Mr. Thomas Beards, of Stowe, bred by the Duke of Buckingham, which won 10*l.*; and a 1 year and 9 months heifer, the property of the same owner, bred by himself, also won a similar sum.

At Norwich, where the Show was held in 1849, another name stands at the head of the list, that of Captain William Inge, of Thorpe Constantine, near Tamworth, who was very successful, gaining a prize of 10*l.* for his 1 year and 5 months old bull, bred by Mr. R. Baker, of Rollright; 10*l.* for his 7 years old cow, bred by himself; and 5*l.* for his 5 years and 8 months in-calf cow, bred by the Hon. M. W. B. Nugent, of Higham Grange;

Mr. Thomas Beards, of Stowe, also winning 10*l.* for his 2 years and 11 months old heifer, bred by the Duke of Buckingham.

At Exeter, in 1850, Mr. R. H. Chapman, of Upton, came out with his 5 years and 4 months old bull, "Earl of Exeter," bred by Mr. S. Chapman, got by "Earl of Oxford," out of "Brindled Nancy," and won the 20*l.* prize. Mr. Thomas Beards won 10*l.* with his 2 years and 9 months in-calf heifer, and also 5*l.* with a 1 year and 10 months heifer.

The next year, at Windsor (1851), Mr. R. H. Chapman was again first, and won a 10*l.* prize for his 2 years and 4 months bull, "Lord Windsor," bred by himself; Mr. Thom as Beards, a 10*l.* prize for his 4 years and 11 months in-milk cow, bred by himself; also 5*l.* for a 2 years and 10 months in-calf heifer, and 5*l.* for a yearling heifer, both his own breeding. A prize of 10*l.* for the best bull calved before the 1st of June, 1849, was withheld.

Lewes saw the Longhorns in diminished numbers in 1852, the only prize-winner being Captain William Inge, who took 10*l.* for his 4 years and 5 months old bull, bred by Mr. Baker, of Rollright, and 10*l.* for his 7-year-old cow, bred by himself. Mr. S. Burberry, of Wroxall, near Warwick, came to the front at Gloucester, in 1853, winning the 10*l.* prize with "Lumber," 1 year and 10 months old, a bull bred by himself; and Captain Inge, another prize of similar value for his 11 years and 5 months milking-cow, "Daisy," also a home-bred one.

The same herds held the front rank at Lincoln in 1854, Mr. Burberry winning with a 1 year and 4 months bull, bred by himself, a 10*l.* prize; and Captain Inge, one of 10*l.* for a 9-year-old cow, "Favourite," in-milk and in-calf; and 5*l.* for a 1 year and 5 months heifer, of his own breeding, "Buffalo" by name. After this came a long interregnum; and the Royal Society's Showyard knew the Longhorns no more, at least as prize-winners, until after Carlisle, Chelmsford, Salisbury, and Chester had been visited. Then we come to Warwick, in 1859, when Mr. John Holland Burberry, of the Chase, Kenilworth, won a local prize of 10*l.* with his 5 years and 3 months old bull, bred by the late Mr. S. Burberry, of Wroxall. Mr. Michael Taverner, of Upton, took 5*l.* with a 4 years and 3 months old bull, bred by Mr. R. H. Chapman. Lieutenant-Colonel Inge, of Thorpe Constantine, was first with a 9 years and 6 months in-calf cow, and 7 years and 7 months in-milk and in-calf cow, both bred by himself. Mr. John Godfrey, of Wigston Parva, won 5*l.* for his 6 years in-milk and in-calf cow, and his 6-year-old cow in-calf, both bred by himself. These were special prizes given by the Warwick Local Committee.

The Longhorns next appeared when 1862 found the Society located in Battersea Park. Then "a change came o'er the spirit of their dream," and Longhorns, instead of being thrown in with other breeds of not sufficient importance for rewards of their own, found classes set apart specially for them. They appear to have responded well to the Society's call to the listed field, and we find Lieutenant-Colonel Inge winning the first prize of 15*l.* for his 4 years and 6 months old bull, "Tom," bred by himself, and got by "Duke" out of "Treasure Trove;" second, was Mr. William Thomas Cox, the Hall, Spondon, who took 5*l.* for his 3 years and 5 months old bull, "Isaac," by "Conqueror," out of "Beauty," bred by himself.

The first prize in the next class went to alien soil, as Mr. James Davis, Melcombe Honey, Dorchester, earned 10*l.* for his 1 year and 3 months old bull, bred by Mr. Joseph Holland, of The Chase, Kenilworth; second to him was Mr. Edward Thornton, of Twycross, Canley, who took 5*l.* for his 1 year and 3 months bull, bred by himself; the reserved number being Mr. W. T. Cox's 1-year-old "Charlie," by "Isaac," dam, "Lively," bred by himself. Amongst the cows, Mr. Richard Warner, of Weston Hill, Nuneaton, carried off the first prize of 10*l.*, with his 7-year-old "Lupin," bred by himself; and Lieut.-Colonel Inge the second of 5*l.*, with the 9-year-old "Fillpail," bred by Mrs. Baker, of Barton-on-the-Heath, Oxfordshire; and the reserved number was Mr. E. T. Twycross's cow, bred by himself. In the class for heifers, Mr. R. H. Chapman was first, taking 10*l.* for his "Young Cumberland," 2 years and 3 months, by "Lord Westmorland" out of "Cumberland," bred by himself. In the next class, Mr. J. H. Burberry, The Chase, Kenilworth, was first and second, with his 2 years and 10 months heifer, and 1 year and 3 months heifer, both bred by himself—taking 10*l.* and 5*l.* respectively; Mr. R. H. Chapman getting the reserved place with "Lady Nugent," by "Lord Westmorland" out of "Wroxall."

In 1863, at Worcester, there was only one Longhorn in the prize-list, and that was Mr. James Davis's bull, 2 years and 2 months old, which won in the open class, beating Welsh, Channel Island, and other bulls. He was bred by Mr. J. H. Burberry. There was not a single entry in the prize-list at Newcastle in 1864, as far as Longhorns are concerned, but Mr. R. H. Chapman carried off the 15*l.* prize at Plymouth in 1865, with "Old Sparkenhoe," 5 years old, bred by Colonel Inge, and got by "Tom," out of "Fillpail," by "Old Rollright," beating a Suffolk for second; when the men of the West showed how impressed they had been with "Earl of Exeter" fifteen years before, by exclaiming that it was the same bull shown on that occasion, thus showing how true both bulls must have been to type, as well as how vividly the illustrious stranger of previous years was remembered. At the same Show Mr. R. H. Chapman also won a prize with the "Brindled Beauty"—2 years and 3 months old—a daughter of "Old Sparkenhoe" and "Fillpail," beating a polled Suffolk for second.

No cattle were exhibited at Bury St. Edmunds in 1867; but Leicester in 1868 saw a very fair lot of Longhorns in the yard, though there was no special class for them. The Duke of Buckingham was first in the open class, winning a 15*l.* prize with "Conqueror,", 4 years and 2 months old, bred by Mr. Godfrey, of Wigston Parva; and Mr. J. H. Burberry carried off the 10*l.* second prize with his 3 years and 3 months bull, bred by Mr. Twycross. In the class for cows above 3 years old, Mr. R. H. Chapman, of Upton, took the first prize of 15*l.* with "Brindled Beauty," 5 years and 3 months old, by "Old Sparkenhoe," out of "Fillpail," by "Washington"; and Mr. Godfrey, of Wigston Parva, was second with the 9-year-old "Red Rose," by "Perfection," out of "Fillpail," by "Conqueror," in-calf and in-milk, getting 10*l.*; Sir John Harper Crewe's "Lofty," a 7-year-old cow, bred by the Hon. R. Curzon, of Hagley Hall, being the reserve number. For heifers in-milk, Mr. R. H. Chapman was to the fore again with "Rose of Dishley," 1 year and 1 month old, by "Earl of Derby," dam "Countess of Leicester," by "Sir Richard Warner," of his own breeding, and took a 15*l.* prize; so that here the curly-coats were pretty successful in open competition. They were not so plentiful at Manchester in 1869, but in the open class for bulls above 1 year old, Mr. R. H. Chapman won 15*l.* with the 5 years and 5 months old "Curzon," by "Hagley Farewell," dam "Jackdaw," by "Wyrley Tom," bred by the Hon. R. Curzon; and in cows above 3 years old, Mr. John Godfrey, of Wigton Parva, won 15*l.* with "Daisy," 8 years old, by "Perfection," out of "Brighteye," by "Conqueror."

At Oxford, in 1870, in the open class for bulls over 1 year old, the Duke of Buckingham was placed first, and received the 15*l.* prize with "Young Conqueror," 2 years and 11 months, of his own breeding, by "Conqueror," out of "Luna," a polled Angus being placed second: and the reserve was Mr. R. H. Chapman's "Earl of Rollright," 6 years and 5 months old, by "Hagley Farewell," dam "Jackdaw." In cows above 3 years old, Mr. John Godfrey, Wigston Parva, won 15*l.* with the 6 years and 3 months old "Red Rose," by "Bosworth Sparkenhoe," out of "Daisy"; a Sussex cow was second; and Mr. R. H. Chapman third, with the now 6 years old "Brindled Beauty." In the heifer class, the Duke of Buckingham won 10*l.* with "Lady Caroline," 1 year and 6 months old, bred by himself, by "Conqueror," out of "Lady." His Grace was first in the open bull class at Wolverhampton, in 1871, and won 10*l.* with his 3 years and 11 months old "Young Conqueror," by "Conqueror," out of "Luna," bred by himself; Mr. John Godfrey winning the second 5*l.* with "Samson 2nd," 2 years and 5 months old, by "Samson 1st," out of "Lady Rollright." This gentleman went up a step in the class for cows over three years old, and took the first prize of 10*l.* with his 7-year-old "Buttercup," in-milk and in-calf, bred by himself, by "Bosworth Sparkenhoe," out of "Brighteye," by "Perfection"; and the Longhorns again came in for the reserve number by aid of Mr. R. H. Chapman's 9-year-old "Light of other Days," by "Sparkenhoe," out of "Brindled Beauty." In the class for heifers under 3 years old the Duke of Buckingham took the 5*l.* for second-best, with "Lady May," 1 year and 10 months old, by "Young Conqueror," out of "Venus," home-bred; and Mr. J. Godfrey's 2 years and 10 months "Beauty," by "Samson," out of "Brighteye," also a home-production, and in-calf, took the reserve number.

The next Show at Cardiff, in 1872, closes the list of Longhorn triumphs until 1876, Mr. Chapman being second, and securing 5*l.* with his 7-year-old "Ivanhoe," by "Sparkenhoe," out of "Fillpail," and getting the reserve number with his heifer "Rollright," 2 years and 3 months old, by "Spondon Knight," out of "Daisy." I now come to the last great event in Longhorn history, the Show held by the Royal Agricultural Society at Aston Park, Birmingham, in July, 1876, when the breed again came to the front in such numbers as to surprise even those who were aware of the fame to which they are once more attaining, nearly 60 being on the ground altogether. Not only were they strong in numbers, but in quality also. Special prizes were given by the Local Committee for bulls over 2 years old, bulls between 1 and 2 years old, cows over 3 years old, heifers in-milk and in-calf, and heifers not exceeding 2 years old, to the amount of 155*l.* 5*s.* And the awards were made as follows: *Bull over* 2 *Years.*—First prize of 20*l.*, to the Duke of Buckingham, for "Conqueror 3rd;" second prize, 10*l.*, to Mr. F. Tomlinson, for "Peeping Tom;" third prize, 5*l.* to Mr. W. S. Shaw, for "Earl of Upton 7th;" reserve number and highly commended, Mr. S. Forrest, for "Crown Prince;" commended, Mr. S. Forrest, for "King Lupin."

Bulls between 1 *and* 2 *Years.*—First prize, 10*l*, to the Duke of Buckingham, for "The Marquis;" second prize, 5*l.*, to Mr. John Godfrey, for "Tiger;" reserve number, the Duke of Buckingham's "Earl of Dadford."

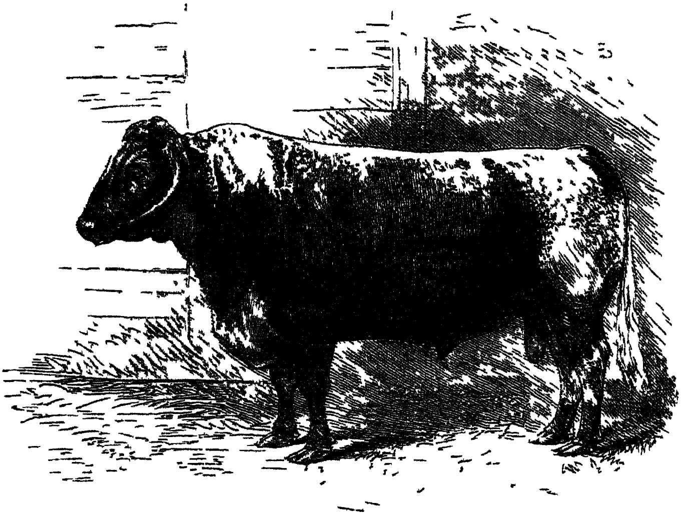
Cow over 3 *Years Old.*—First prize, 20*l.*, to Mr. Samuel Forrest, for "Lady;" second prize, 10*l.*, to Mr. S. Forrest, for "Bluebell;" third prize, 5*l.*, to Mr. T. Satchwell, for "Rosemary;"

reserve number and commended, Mr. T. Satchwell, for "Lady Forrest."

Heifer in-Milk or in-Calf, between 2 and 3 Years Old.—First prize, 20*l.*, to the Duke of Buckingham, for "Lady Twycross;" second prize, 10*l.*, to the Duke of Buckingham, for "Barmaid;" third prize, 5*l.*, to Mr. F. Tomlinson, for "Lady Western;" reserve number and highly commended, Mr. F. Tomlinson, for "Loophorn 4th;" commended, Mr. Godfrey, for "Bashful."

Heifer not exceeding 2 Years Old.—First prize, 20*l.*, to the Duke of Buckingham, for "Countess of Temple;" second prize, 10*l.*, to Mr. W. N. Berry, for "Pride of the Park;" third prize, 5*l.*, to Mr. W. N. Berry, for "Weston's Farewell;" reserve number and highly commended, Mr. T. Satchwell, for "Bloom;" commended, Mr. W. N. Berry, for "Young Strawberry's Perfection."

Fig. 2.—*The Duke of Buckingham's Longhorn Bull, "Conqueror 3rd."*



I certainly never saw such a show of Longhorns before, and there were some really grand bulls amongst them. The Duke of Buckingham's "Conqueror 3rd" (Fig. 2) is a capital specimen. He is descended from the herd of Mr. Godfrey, of Wigston Parva, who bred his grandsire, "Conqueror 1st," first-prize bull at the Royal Show in 1868. Mr. Tomlinson's bull was a remarkably level animal, but not so deep in his ribs as might be wished.

Mr. Shaw's "Earl of Upton 7th" was a noble specimen of the breed, and very beautiful in colour. Like two capital bulls shown by Mr. Cox, he was bred by Mr. R. H. Chapman.

The reserve number, Mr. Forrest's "Crown Prince," was a grand bull, but perhaps no animal attracted greater notice from the public than Mr. T. Taverner's "Royal Duke," who stood at the end of the shed, where he was surrounded by crowds of visitors each day. No doubt he was the heaviest bull in the class, and he turned the machine at 24 cwt. The sires of "Crown Prince" and "Royal Duke" were both bred by Mr. Chapman, at Upton.

The heifers of the Duke of Buckingham were very good, as were those of Mr. Tomlinson; and the yearling heifers of Mr. W. N. Berry were beautiful specimens of the breed, showing great purity, and nearly as early maturity as many of the Shorthorns. After such a successful exhibition it is no wonder that Longhorn men have petitioned the Council to recognise the breed in future prize-sheets. When shown, even in competition with the famed Shorthorns, they have by no means been invariably worsted; and the Duke of Buckingham's "Conqueror," before mentioned, had the honour of beating one for the Cup presented to the best animal in the yard at the North Hants and Bucks Show, held at Aylesbury in 1868, or in the district; and, it must be remembered, he was judged by Shorthorn men, nor is his a solitary instance of prizes so gained.

A very fair estimation of the value a herd possesses for feeding purposes may be found by the weight they come to at any given age; and here I am pleased to say that the Longhorn comes out uncommonly well, as I found in a comparison, made by me some time ago, of various prize-winners at the last Birmingham Show held at Bingley Hall, with Sir John Harper Carew's steer, 3 years and 9 months old. In the whole Show only two steers of the same age were so heavy as this son of "Earl of Upton the 1st," and they exceeded him by very little. At the same time it must be borne in mind, that owners of Longhorns have never sent them along from calfhood, as is the general custom with breeders of other stock when they contend for prizes, but have kept their young things in ordinary store condition, and then put them up to fatten in the usual way; hence we scarcely know what the Longhorn is capable of doing as a beef-maker when given those extra facilities for laying on flesh. I trust that, now so much fresh interest is awakened in the breed, some of those gentlemen possessing good herds will take the subject in hand, and by putting some young beasts in training for Show purposes from their earliest days, never letting

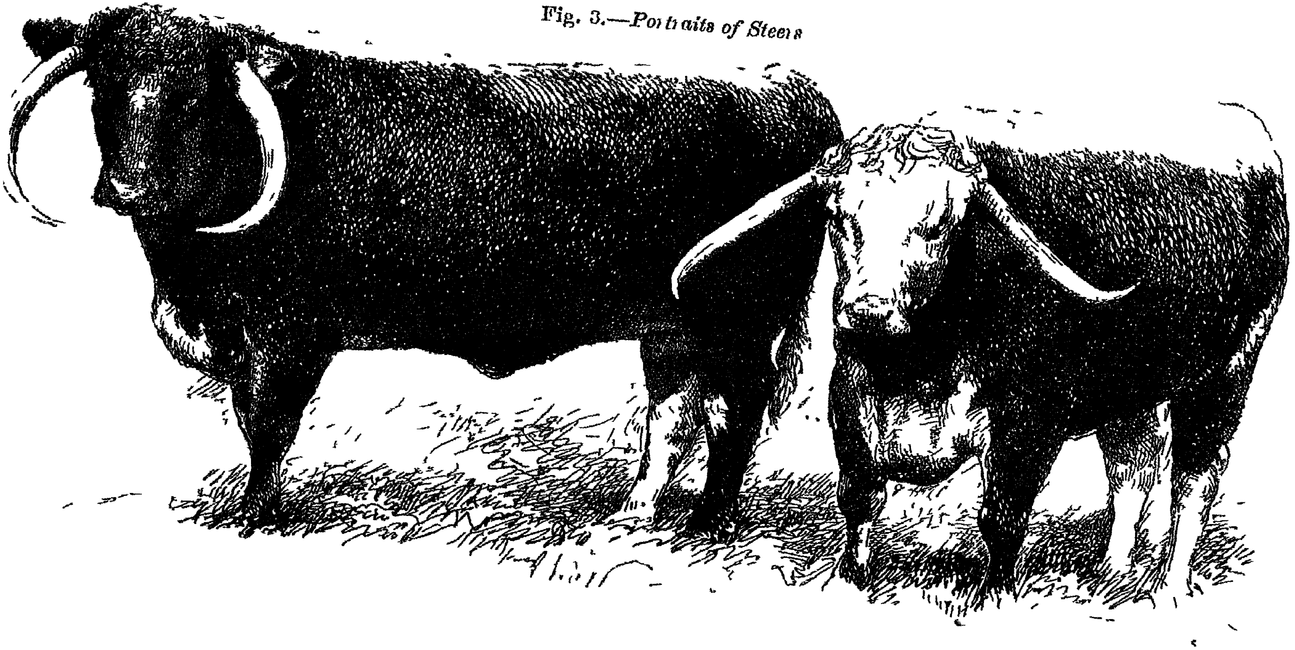


Fig. 3.—*Portraits of Steers*

them lose their calf's flesh, demonstrate to the world what their favourites are really capable of doing.

Having thus shown what the breed has done in the show-yard, I must advert, for a little space, to the fact of their having been hitherto so little known and appreciated by agriculturists generally, who appear to have had no idea of the position they held in rural economy In Mr. J. Moscrop's Essay on the Farming of Leicestershire, awarded the prize of 50*l.* in 1866, he says:

"The Longhorns—a creation of Bakewell's—were once the rage of the day, and the natural herd of the country, *but they are now nearly extinct.*" After speaking of Mr. Chapman's herd, he goes on to say: "Great enthusiasm is exhibited by the patrons of this breed, and assertions confidently made that, besides their great hardihood, they render as good a return for the food consumed as the best animals of the most favoured breeds. As milk-producers they are deficient, although what they do produce is particularly rich in cream. Their utility, however, either for the dairies of the west, or the fattening pastures of the east side of the country, is pronounced by the majority doubtful, and *whether they can much longer struggle for a separate existence is at least an open question.*"

Mr. Moscrop has quite fallen into an error in calling the Longhorns a creation of Bakewell's. He was, it is true, the great pioneer of the day, but, as I have shown, the Longhorn existed long before his time, and he was only contemporary with Lea, Fowler, Paget, Prinsep, Chapman, Knowles, and Astley; and Fowler and Prinsep, at any rate, made higher figures than Bakewell is known to have done. It is all the more extraordinary that the writer should have fallen into the error of asserting that Longhorns were nearly extinct, and could not much longer struggle for a separate existence, as the following remarks, taken from 'Bell's Weekly Messenger' of 1861, show that at the Sparkenhoe Club, five years before this was written, Longhorns had been shown in very considerable numbers. "The peculiarity of the Club we have now to deal with in this article is the encouragement it gave Longhorn-breeding, which was of a purely exceptional character. We have set eyes on pure Longhorns many a time before, but it was certainly the first time that we saw so many at a single exhibition of stock. There were thirty entries of Longhorns at this Sparkenhoe Show, some being of the finest character both in breed and quality; the especial district of this class of stock is compassed within the radius of about 30 miles of the spot, and the appearance of this class of animals gave an unusual appearance to the exhibition. Dishley, of Longhorn fame, is only 15 miles off; whilst the abodes of Astley, Knowles, and Paget, may be termed within bow-shot." The 'Times,' also, in a leading article of Monday, September 16th, 1861, remarks on the peculiarities of the Club, one of the greatest of which was ladies joining the gentlemen at the dinner-table, saying, "900 ladies and gentlemen sat down to eat and drink under a tent," and called it a "a great Conservative Feast of Tabernacles in a Midland County of England," "the classic ground where Richard III. lost his life and his crown." The Show was held at Market Bosworth. The Club had set the example of ladies dining as early as the year 1853. It is pretty plainly proved, that however the Longhorn may have sunk in general estimation, there was small chance of his dying out in his native district, though Mr. Moscrop's remarks tend to show that ten years ago he was very little known beyond it, and was perhaps as great a curiosity to the bulk of English farmers as a live mastodon would have been.

The next important event in Longhorn annals to which I must allude is the dispersion of Mr. R. H. Chapman's herd at Upton in 1873. Founded as early as 1756 by Mr. George Chapman, and carefully bred from that date from the very best strains of blood that could be procured, they deservedly took rank as one of the best, as well as oldest, herds in existence; and with the remembrance of the good qualities inherent in the breed, many went there as purchasers to lay the foundation of future herds. That sale may therefore be looked upon as a fresh starting-point from which the history of the breed will be traced. It is well-known that similarity of characteristics in cattle always denote purity of race, and careful selections of a recognised type during a long course of years is the only way to secure this greatly desired effect. Like the Drakelow Baronet, mentioned in a former part of this article, and no doubt guided by the same principles, the Chapman family succeeded in breeding "a dairy of Longhorn cows, alike in colour and shape," for the 51 offered at Upton showed a remarkable likeness to each other, all possessing the orthodox white back and other characteristics. A gentleman who takes much delight in breeding, but who had never seen Longhorns before, was attracted to the Upton sale, and after examining them said, "This is indeed a beautiful sight." This sale was not only a great success, but it took almost the character of a farewell fête given by persons of all degrees, to their old friend and neighbour, Mr. Chapman, who was about to remove to St. Asaph, in North Wales. The late Earl Howe took the chair, and Mr. J. H. Burberry the vice-chair, and nearly every owner of Longhorns in the country was either present himself, or in some way represented there. When Messrs. Lythall and Clarke came to sum up, an average of 33*l.* per head had been reached, including those animals sold to the butcher. One 2-year-old heifer realised 50 guineas, and 14 of that age averaged 40*l.* 15*s.* 3*d.* The yearlings and calves were reserved, and subsequently sold as 2-year-olds during the Birmingham Show-weeks of the following years 1874 and 1875. In 1874 the 12 reached an average of nearly 37*l.*; and the grand "Brindled Beauty," quite the star of the lot, and one of the most beautiful heifers I ever saw, went to Mr. Townley Parker's bid at 67*l.* 4*s.* In 1875, though the lot was on the whole more even, and I fancy in better condition, the average was a trifle less, being 34*l.* 15*s.* for 15 of them; but there was no "Brindled Beauty" there to outshine the rest, and "Upton's last link" headed the bill with 49*l.* 7*s.* The 78 Longhorns Mr. Chapman sold in 2 years averaged 34*l.*, and 7 of the 2-year-old heifers averaged 50*l.* 14*s.* These averages compare very well with a large proportion of the Shorthorn sales, held from January to November in 1875, as out of 122, 56 were either below these, or the same price as nearly as possible, so that, considering the comparatively small number of Longhorn buyers, they have very fairly held their own in the sale-ring as well as in the showyard.

On the day of the last sale, a meeting was held in Bingley Hall, with a view of establishing a Longhorn Society and herd-book, at which Mr. T. L. Prinsep, of Croxton, took the chair; and amongst other breeders, Col. Dyot, M.P., Mr. W. P. Cox, Mr. Oxley, Mr. Townley Parker, Mr. R. H. Chapman, Mr. Godfrey, Mr. Satchwell, and Mr. Taverner were present. Resolutions were passed as to the necessity of forming a Longhorn Society, and establishing a herd-book; and a committee was appointed, consisting of Sir J. H. Crewe, Bart., Mr. W. T. Cox, Mr. T. L. Prinsep, Mr. J. H. Burberry, Mr. Townley Parker, Mr. R. H. Chapman, and Mr. Oxley, to consider and report to a general meeting to be held at Birmingham during the Meeting of the Royal Agricultural Society there in 1876. This idea was carried out, and a meeting held, at which the Duke of Buckingham was elected President of the Longhorn Society; Sir J. H. Crewe, Bart., Mr. W. T. Cox, and Mr. T. L. Prinsep, Vice-Presidents; Mr. Joseph Burberry, Treasurer; Mr. R. H. Chapman, Mr. S. Forrest, Mr. J. Godfrey, Mr. J. T. Oxley, Mr. T. Satchwell, Mr. W. S. Shaw, and Mr. V. B. Watts, to act on the Committee; and Mr. J. B. Lythall as Hon. Secretary. The rules and regulations of the Society are now published.

I now come to the sale of Mr. Brown's herd at Farewell, in March last. These, although of undeniably pure blood, did not make so good an average as Mr. Chapman's, as Mr. Brown of late years had neglected colour, and bred them entirely for dairy purposes without regard to other qualities; but as I have shown in former years, the herd won several prizes, and animals from it were sold at high figures. At this sale Mr. W. T. Cox bought the bull "Nelson" for 35*l.* 10*s.*; Sir J. H. Crewe, the bull "The General," for 26*l.* 6*s.*; and Mr. T. L. Prinsep the heifer "Lady Prinsep" for 25*l.* 4*s.* The cows averaged over 20*l.* each, and it must be borne in mind that they were only in store condition. A friend who was present sent me the following, which, as illustrating some of the points of the breed, may amuse my readers.

"The great revival in favour of what is here called the old Staffordshire Longhorn induced me to go and see a herd sold on their native soil. The morning, like all the rest in this month of March, was a truly cold and wet one; however, I was fain to make the best of it, and after admiring the lovely cathedral of Lichfield, went on my way to Farewell—or, as the common people here call it Farrell; on the road I was joined by a working-man, and we soon got into conversation about the stock to be sold. He said Mr. Brown's were the only beasts of the sort about; and when pressed for the reason of this difference in farmers' tastes, added, 'Why, the people here know nothing about them; they all run after the new-fashioned sort, but Mr. Brown has tried them and knows they are best for him.' Being questioned as to the reason why they were better, he said; 'Why, they give such good and rich milk, that the cheese made from them is as much different as between chalk and cheese; and they are such good feeding-stock, and are not gluttons at eating, but will just eat anything you give them, and what is more, they will do on poor land, and this Mr. Brown has found out many years ago. I have seen them for years, and I know it is quite true.' I think this a good character of the breed spoken without any interest to serve, and after real honest Staffordshire fashion. Mr. Brown's homestead is the old Manor House of Farewell, and within a stone's-throw of the old church, where the Browns have found a resting-place for centuries, as the following doggrel rhyme testifies—

"'Farewell Hall and Farewell Hill,
Farewell *Brown* and Farewell mill,
Farewell Church and Farewell steeple,
Farewell all ye Farewell people.'"

A still more recent sale is that of Mr. T. Satchwell, held on Friday, July 21, 1876; but as buyers were shy, on account of the scarcity of keep, many of the animals were bought in, so I must refrain from giving an average, and will only say that the animals were a credit to their owner, and much admired.

Having now brought the history of Longhorns down to the present date, I shall be expected to say something of their peculiarities as milkers and feeders, and I am pleased to state that, so far from being forced to rely on my own observation and judgment respecting these important points, I am at liberty to publish some letters on the subject from people whose experience of their goodness, as well as their defects, extends over lengthened periods, and far exceeds what could by any possibility have come within the scope of my own observation. Before giving them, however, I must recount a few anecdotes of the breed gleaned from other sources. First, noting the fact that the milk-sellers say the milk is too rich and good for them to be able to sell it at the usual price, I may quote a passage from "The Druid's" excellent article on Longhorns, written about ten years ago,* wherein he records the following experiment:—"Mr. S. Craven Pilgrim, of Burbage, near Hinckley, is a noted breeder of Shorthorns, which are of the Bates blood, and which he cultivates for milking properties. Mr. Pilgrim selected his six best cows against a like number of Mr. Chapman's" (Longhorns). "The Shorthorns produced 152 lbs. of milk, and the Longhorns 135 lbs. The weight of curd for the Longhorns was 19½ lbs., but that from the Shorthorns only 14½. This experiment was made in June. The trial was again made in September—the whole of Mr. Pilgrim's cows, numbering 36, against Mr. Chapman's 32 Longhorns. The Shorthorns produced 605 lbs. of milk, which made only 66½ lbs. of curd. The Longhorns produced 553 lbs. of milk, which made 69 lbs. of curd." This experiment carries out the milk-sellers' idea. It is known that, when ripe, they are good butchers' beasts; and years ago the breed was celebrated in Smithfield Market for giving the greatest number of valuable cuts from the back and ribs; and they are known to "die well," to use a butcher's term. That they are capable of coming to as early maturity as any other breed is proved by heifers having been brought up in company with Shorthorns of the same age and first-rate blood, when there was no perceptible difference in that respect; and a Shorthorn man once said, "I know the Longhorn breed well, and feel sure there are no more serviceable animals under the sun for general purposes, and I wish I had them now." Again, a large landowner summed up their qualities in this wise: "Since I gave up Longhorns, no cattle have done so well on my estate as they did, and I shall endeavour to procure them again." With regard to their feeding on a small quantity of food, I have it on good authority that a Longhorn-breeder on one occasion tried some Shorthorns with his cattle. He observed the latter often without food, whilst the Longhorns were busy at

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* 'Mark Lane Express,' January 7th, 1867.

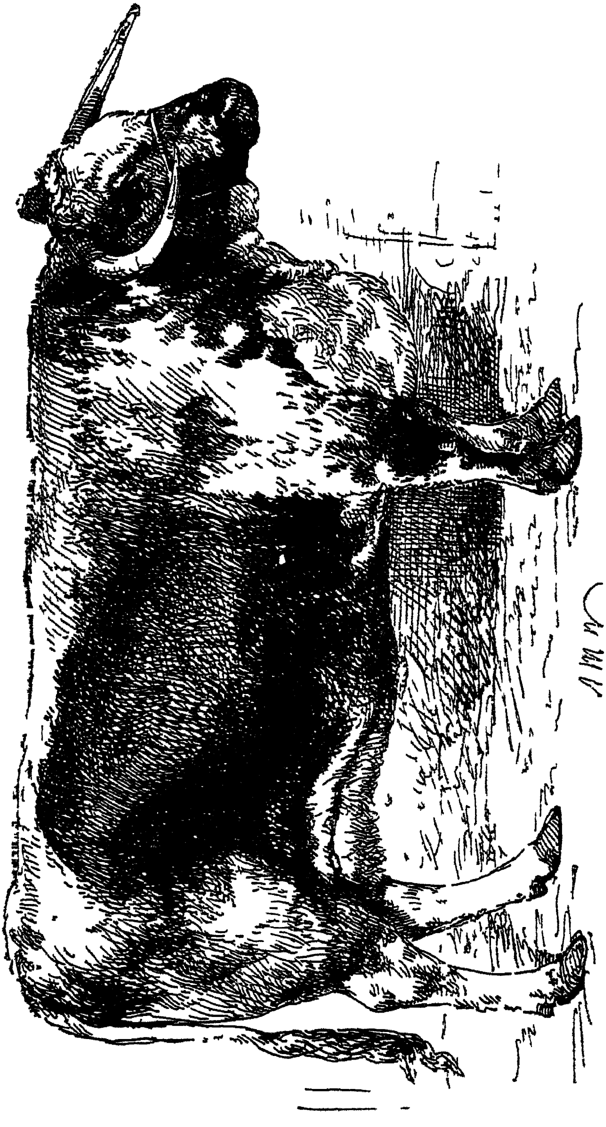

Fig. 4.—Portrait of a Cow.

their meal in the same shed, and said to his herdsman, "Why don't you feed all these cattle the same?" The answer was, "I give them more than the Longhorns, but it is gone directly: I never 'seed' such eaters in my life."

A very large grazier, who feeds all breeds of cattle, says: "I have noticed the Longhorns, and I think they are a hardy docile race of cattle, and good thrivers for the food given them." Another thing in their favour may be quoted from the experience of Mr. Phillips, of Eastern Green, near Coventry, who says, "I have been a Longhorn-breeder for sixteen years, and have never had any portion of the herd attacked with foot-and-mouth or any other disease, although disease has been prevalent with the other stock on the farm, and in the immediate vicinity." These Longhorns were bred from the herd of Mr. Twycross, of Canley. As an impartial historian, however, I am bound to say that, as a set-off against their good qualities, some breeders have found a difficulty in rearing Longhorn calves during the earlier stages of their existence; but once get them over the dangerous period, and no hardier cattle could be wished for. The following letters will give a better insight into their characteristics than anything which I could say.

Miss Brown, of the Manor House, Farewell, says: "I prefer the Longhorns before any other breed of cattle, because I have proved their value in the making of cheese and butter. Many years ago, when I was quite young, my father lost a great number of his Longhorn cows, and we had to procure the best cattle we could to make up the dairy. I soon found it took considerably more milk to make the cheese the same size as when I had the old-fashioned Longhorns. It would not do for me to take any butter from the milk of the new cows, as their milk was not so rich. Our neighbour, who has had great experience, says, he is sure three Longhorns will live on the same food as two Shorthorns." Mr. George Edmonson, who farmed at Broomfield, near Milnthorpe, Westmoreland, writes: "My Shorthorns were subject to a disease called 'joint-evil' or 'joint-foul,' or, as some call it, 'cripple-felon,' but my Longhorns were perfectly free from this disease, although they went on the same land. I have had Shorthorns which completely lost the use of their legs, and sometimes I had to kill them. That is the reason I tried Longhorns, and found them suit my land much better than other breeds." Mr. Edmonson farmed amongst Westmoreland peat and boulder stones.

"Dear Sir, "Lee Lane, Admaston, Rugeley.

"Nothing gives me greater pleasure than to comply with your request to give you my impartial opinion of the Longhorn beasts. The farm I have just left under Lord Bagot has been in the family about 280 years.

During that time there was nothing kept but Longhorn cows of the old original Staffordshire breed, brindled sides with a white mark along the back. I have had thirty-five years' experience in breeding, rearing, and feeding, both Longhorn and Shorthorn cattle, but I always give the Longhorn the preference, as their milk is much richer in quality. The cheese and butter made from them is also superior in quality. They are also more hardy in constitution, and consume less food as well as being more docile in the pasture. We scarcely ever knew them to leave it unless driven out by the cowman. Many of our great Shorthorn breeders of the present age argue that they do not come to maturity so soon as the Shorthorn. One great reason of this is, they as a general rule are never taken the care of and forced as the Shorthorns are now. I sold an ox to Mr. Shipley, of Uttoxeter, two years and nine months old, which had never tasted cake in his life. He weighed 13 scores per quarter, and Mr. Shipley, a man of fifty years' experience, told me that he was of his age the very best beast he had ever killed. From my own experience I am quite convinced that, with the same care and attention paid them as is bestowed upon the Shorthorn, there are no beasts superior to them in England. As a great admirer of the old Longhorn, any farther information that I can give you will give me great pleasure.

"T. P. Tomlinson."

"Hardendale Shap, Westmoreland,
"April 11th, 1876.

"Dear Sir,

"You ask me to give you any information I can about the Longhorns. When I was a boy they were the only breed kept in Westmoreland, and I consider them the most suitable for high land, as they are a very hardy race of cattle; and by making a wise selection of bulls, and not breeding *in-and-in*, the Longhorn can be farmed to advantage. I consider their milk to be very good for butter- and cheese-making. As a proof of this, I was an exhibitor of butter at the Westmoreland and Cumberland Show last year, and obtained the first prize for a firkin of butter, and a second prize for prints. I also exhibited at the Appleby and Kirkby Stephen Show, and came off with first honours there. As my few Longhorns are all that are kept in Westmoreland, I think that speaks in their favour. They have their drawbacks, being very difficult to rear as calves, and require much attention when young; but when they arrive at a certain age, they are heavy-fleshed, and prove well to the butcher. Try them with any other breed, and I think, for the food consumed, they will give as good a return, if not better. Should they ever again be tried upon the Westmoreland or Cumberland Hills, I think they would answer better for the grazier than the Irish cattle, as the land is greatly improved within the last forty years where they used to be kept.

"Mathew Hewertson."

These letters tend to prove various good qualities in the breed to which I have before called attention, and at the same time do not shrink from mentioning the drawbacks that are to be looked for in it. Mr. Tomlinson's letter is valuable in another sense as showing their very great antiquity, and that so far from their being "a creation of Bakewell's" they were in his family as much as a hundred and eighty years before Bakewell's epoch. Having spoken of them as milkers and feeders, there is another quality to which I must allude, which is their great longevity, no slight advantage to any one, and especially to a poor man who cannot afford always to be dipping into his pocket to replenish his dairy. So great is this, that in countries where they are kept, "as old as a Longhorn cow" has become a proverb. They have been known under various names and titles; some writers having termed them "Bakewell's Longhorns;" others "the Leicestershire Longhorns," "the Warwickshire or Staffordshire Longhorns," &c., of course all being only local names for the same breed; as Oxfordshire has its "Rollright;" Warwickshire its "Canley;" Leicestershire "Dishley," "Nailstone," "Upton," "Odstone," and "Ibstock;" Staffordshire its "Farewell" and "Fradley;" and Derbyshire its "Croxall" and "Brailsford;" so some five or six counties lay claim to the breed. Many noblemen and gentlemen have kept them for years. Amongst others, the Duke of Buckingham, Earl Howe, and Lord Bagot. Sir J. Harper Crewe, who returned to them after having a herd of Shorthorns, the last of which, an old cow, I saw when looking over his Longhorns at The Abbey a year or two ago. Mr. T. L. Prinsep, whose ancestors were so renowned in Longhorn annals, has also returned to the faith of his fathers; Mr. Cox of Spondon, Mr. Townley Parker, and several others; while amongst tenant farmers there are yet to be found herds whose foundation dates back for several generations. No breed could be found more suitable to adorn the park or the home pastures of Hall or Grange; for the long tapering horns, sometimes eight feet in width, and tapering in spiral curves from the head, at others wreathed into the most picturesque and fantastic shapes, the true colour brindled red or finch, with white backs, and the rough curly coats, must render them objects of admiration to all who have an eye for the beautiful, while their docile tempers peculiarly fit them for parks or much frequented pastures. The Longhorn has endured a long eclipse; but now there seems every indication that he is about once more to emerge from obscurity, and take his proper place amongst the magnificent breeds of cattle for which England is famous.

XVIII.—*Report on the Warwickshire Farm-Prize Competition*, 1876. By Herbert J. Little, of Coldham Hall, Wisbech.

The custom originated by the Royal Agricultural Society in 1870, of offering Prizes for the best cultivated Farms in the County in which the Annual Show takes place, seems now to be established on a firm foundation, and is probably by no means the least useful of the means it employs for the improvement of practical agriculture. The most phlegmatic agriculturist in the neighbourhood will probably have his attention excited by the skilfully managed farms which are honoured with these very substantial prizes, and which by this means obtain a descriptive notice in the 'Journal.' The more intelligent farmer will generally find something worthy of his observation on the other side of his neighbour's hedge. It is true that not every farm can offer any striking novelty, and that success more often depends on industrious and painstaking efforts than on the adoption of every fresh scheme or expedient which science may suggest or invention devise; but in the agricultural world, the enlightened man is often he who is most conscious of his own ignorance, and is therefore willing humbly to avail himself of every opportunity of increasing his knowledge and improving his practice. If, therefore, in the following Report, I shall be thought to have entered more closely into details than was necessary on some points, let it be remembered that, diverse as is the agriculture of these islands, it may serve some useful purpose to follow with minuteness the principles and practices carried out on these respective farms; and that, at any rate, many young beginners may derive profitable lessons from the systems of management here recorded.

In connection with the Birmingham Show of this year, the following prizes were offered by the Local Committee for the best managed farms in the county of Warwick, the farms being divided into the two classes of large and small occupations:—

In Class I., which was limited to farms exceeding 200 acres in extent, two prizes of 100*l.* and 50*l.* respectively; and

In Class II., which embraced all farms below 200 acres, two prizes of 50*l.* and 25*l.*

A further sum of 25*l.* was placed at the disposal of the Judges to enable them to recognise special merit in any farm entered in either class; and as usual the competition was limited to tenant-farmers paying a *bonâ fide* rent for not less than three-fourths of the land in their occupation. The Judges were instructed especially to consider:—

1. General management with a view to profit.
2. Productiveness of crops.
3. Goodness and suitability of live stock.
4. Management of grass-land.
5. State of gates, fences, roads and general neatness.
6. Book-keeping.

The last day of entry was fixed for October 1st, and it was then found that the competition was very limited, only five farms having been entered in Class I., and not a single entry having been made in Class II. This, in a county by no means remarkable for large holdings, was somewhat surprising; and altogether the paucity of entries presented a significant contrast to those of the neighbouring county of Oxford, where in 1870 twenty-one farms competed; and indeed to any subsequent competition under the auspices of the Society.

It is, perhaps, not difficult to conjecture some of the reasons for this notable falling off. Independent of the serious disarrangements which difficulties in regard to labour have entailed upon the farmer during the last four years, the season of 1875 was (at least in the Midland Counties) one of the most trying with which he has had to cope, perhaps, during the present century; and it may well be that many excellent agriculturists were deterred from exhibiting their occupations by the unhappy appearance which too many of them presented after a season of such unparalleled difficulty.

The Judges, having received their instructions, decided to make their first survey early in November, to enable them to observe the system of stock-feeding pursued on each farm. With this object they met at Leamington on the evening of the 9th of that month, and on the three following days made a thorough inspection of the five farms enumerated below. This visit was, unfortunately, timed with one of those recurring cataclysms which distinguished the season, and our inspection was carried out with some little difficulty, owing to the sodden condition of some of the land, which we were assured by each competitor, in turn, was unequalled in his experience. The subsequent visits were paid in the second week in May, when all the farms were carefully looked over, and on the 18th and 19th days of July, in the week of the Birmingham Show, when the three prize-farms were again subjected to a minute scrutiny. The weather on each of these occasions presented a remarkable contrast to that of the autumn visit; that of May being distinguished by cloudless skies and great dryness of atmosphere, and that of July by a glowing temperature which will long be remembered by the visitors to the Showyard at Birmingham. The farm-work in November was very much in arrear, only one piece of wheat having been planted on the whole of the inspected farms; and sheep penned on turnips up to their bellies in mud did not look at their best, or augur very favourably for the future crop. In May, however, all was changed; the wheat, though backward, was looking fairly; but much barley was only just peeping from the ground, which on some descriptions of land had evidently been reduced with infinite trouble. But the extraordinary character of the season was displayed at our July visit, when the grain-crops were already yellowing for harvest, and when, notwithstanding the vicissitudes of the year, the farms were for the most part looking full of promise, the appearance of the wheat in particular being superb.

It may, perhaps, not be out of place to append to this Report some slight sketch of the principal geological features of the district in which the Show-farms are situate; and it is necessary, in the first place, to remark that all of them are in the southern division of the county, and that four out of five are in close proximity to the River Avon, the remaining one being only a short distance from the banks of that stream; and that, therefore, my own personal observations were confined within somewhat narrow limits.

It is not difficult to give a general outline of the geology of South Warwickshire; but I much regret that the *data* are wanting (or at least I have not found them available) for a correct description of those surface phenomena which are of prime interest to agricultural readers. I would willingly have given some details of those superficial accumulations which here, as elsewhere, have obscured or obliterated the distinctive marks of the earlier formations over considerable areas, and which in no small degree influence the agricultural character of the districts on which they are deposited; but it is unfortunate that no reliable information can at present be obtained upon their extent or their general characteristics; the maps of the Geological Survey containing no indications of their presence except so far as the alluvial deposits of the river-valleys are concerned.

As a great deal of "drift" matter is spread over the district, it will readily be understood that the typical characteristics of the sandstone and the lias soils are much influenced, where this is the case, by the presence of these accretions; and that a mere reference to a geological map upon which these deposits are not laid down is an insufficient guide to an agricultural reader, whose object is to make himself acquainted with the character of the soils and the capabilities of the land, rather than to study its greater geological phenomena.

Almost the whole of South Warwickshire is occupied by the New Red Sandstone and the Lias formations; and it is, perhaps, a noteworthy fact that all the competing farms are upon the sandstone. The fertility of the soils on this formation varies considerably; but upon the whole they are excellent lands under cultivation, varying from a strong marl to a light gravel.

In the neighbourhood of Kenilworth, and taking in all the country in the direction of Coventry, the Permian system is developed, and it is upon this that Mr. Simpson's and Mr. Wakefield's farms are situated. The very fine oak and elm timber of this part of the county attests the natural fertility of the land, although in many spots there is perhaps too much for agricultural purposes. A large district, east, south, and west of this, is occupied by the Keuper of the New Red Sandstone, which extends over almost the entire south-western corner of the county, whilst the whole of the south-eastern portion is taken up by the Lias. The difference in the agricultural character of the Permian and Triassic systems is, as might be expected, much less distinctly marked than that between the sandstone and the Lias. In the drive from Stratford to Bidford, for instance, the generally cold, tenacious character of the latter formation is well exemplified; and the backward state of the agriculture of such districts is very striking by contrast with the warmer and more fertile loams of the sandstone in the neighbourhood of the former place. Such names as "Starve-all," "Cold-comfort," &c., which one finds dotted about on this portion of the Ordnance Map are, perhaps, suggestive of the character of the land.

The valley of the Avon has long been considered one of the most fertile districts of the county. It is in a great measure occupied by the usual diluvial loams and gravels; but in many places, at considerable elevations, the surface of the land is much covered with the glacial deposit of the "Northern drift." In such spots the soil consists principally of a gravelly loam containing a great variety of pebbles, derived probably from the primitive and other rocks of Northern England. The stones are mostly rounded; but the late Mr. H. E. Strickland, whose geological researches are well known, was of opinion that, in many cases, they had been brought direct from the conglomerates of the New Red Sandstone, and therefore that "we should be cautious in attributing their rounded form to the transitory action which placed them in their present position." *

The general appearance of South Warwickshire is pleasant, and, if not strikingly picturesque, is at least marked by that soft

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* Since this was written I have received an interesting note from the Rev. P. B. Brodie, of Rowington, near Warwick, an eminent local geologist. He informs me that in his neighbourhood the pebbles of the drift matter "are chiefly Lower Silurian, as seen by their fossils, but many others are found from rocks of all ages, from the cretaceous downwards, flints abounding in places. In the Avon valley the gravel is finer, and what is called 'low level drift,' with, rarely, mammalian remains." Mr. Brodie also says that where the Lower Keuper marls are developed, the surface, for the most part, consists of cold clay; and that the Upper Keuper Sandstone, "which runs in irregular patches, somewhat influences the soil, as its chemical ingredients differ considerably from those of the green and red marls, both of which occur in the upper and lower divisions of the New Red Sandstone." "The Permian, in the neighbourhood of Kenilworth, Coventry, &c., consists of red and grey sandstone rock more or less hard, divided by green and red marls, but no magnesian limestone proper."

I have not thought it necessary to speak of the Lower Oolite which forms the cap of the Lias on some of the hills in the extreme south-eastern portion of the county, as the farms we visited were far removed from that neighbourhood.—H. J. L.

stamp of beauty which is one of the principal features of the Midland districts. Fine elm and oak timber abounds on the sandstone soils in particular, and gives character to the scenery. The climate is pretty equable, and, in the absence of any considerable hills, the variations in the ripening of crops, &c., are more attributable to the diversities of soil than to elevation. The rainfall is moderate, and averages somewhat more than in Eastern England; but far less than in the Western and South-western Counties. I find by Mr. G. J. Symons' Tables that at Leamington the rainfall for the last fourteen years, as taken by Mr. S. U. Jones, has amounted to an average of 25·34 inches per annum. The greatest amount fell in 1875, viz. 36·32 inches, and the driest year was 1870, which only yielded 17·79 inches.

The most prominent agricultural features, to the eye of a stranger, are easily enumerated. Land which will breed and feed fine large sheep to perfection in 14 months; which will grow with very little external aid fine crops of wheat, barley, beans, and peas equally well—and on which 50 tons of mangels of the finest quality can be produced to the acre without any extravagant outlay in manures—is of a kind which would be highly esteemed in any part of England. It is hardly too much to say that this is the common character of the better sorts of land in South Warwickshire, and the general impression is, therefore, that of extreme fertility. The farming seems to vary more than the soil; and although our immediate business lay with land in the highest state of cultivation, we could not shut our eyes, in the numerous drives which it fell to our lot to take, to the fact that a good deal of land was ill-farmed, and indeed the evil plight of some we saw could scarcely be exaggerated.

The policy of making "two-year-old beef" has lately excited much attention in the agricultural world; but whatever may be thought of that, there can be little question of the advantage, on suitable land, of making one-year-old mutton; and it may be doubted whether this practice has been carried in any part of England to greater perfection than in Warwickshire and the neighbouring counties. In the month of May, travel where one will, the busy sound of the shears is heard, and grand indeed are some of the animals which come forth from the process. The sheep of the county are the Oxford Downs, though these are not universal, Shropshires being adopted on some farms, and various mixtures of Cotswold blood on others. But, whatever the breed, the object always seems to be to make fine heavy sheep at 12 or 14 months old; and Stratford Market has of late years acquired some celebrity for its exhibition of this description of mutton. From April to June about 1500 sheep are disposed of by auction every week, and these are almost exclusively clipped tegs. Mr. Hutchings, one of the auctioneers, informed me that during the present spring, although no prizes were offered, and therefore no sheep specially prepared, the high price of 87*s.* 6*d.* was made of a pen of fat tegs; and he added that this price has been exceeded in former years. As is mentioned in the report of the farm, a pen of Mr. Stilgoe's in May fetched 85*s.* 6*d.* out of the wool; and 75*s.* seemed a common price on the farms we visited.

The cattle struck us as by no means so good as the sheep; but dairying having much gone out of fashion, it may be expected that pure-bred bulls will soon be more extensively used, and leave their stamp upon the future race.

It was impossible to enter the county without remembering that from it sprung that remarkable agitation in 1872, which so quickly extended to the rest of England, and without considering how far that movement had affected the wellbeing of the labourers themselves, and how far also the general course of agriculture. Speaking generally, then, the information we received led us to the conclusion that though wages had advanced since 1872 about 3*s.* a week for ordinary labourers, much of this had been saved to the masters by the increased use of machinery, and a more general employment of piecework. As far as we could observe, the labourers on the best farms are very comfortably off, occupying good cottages at either a very low rent (as in the case of Mr. Adkins, whose men pay 1*s.* a week), or paying no rent at all, as in Mr. Stilgoe's case. The appearance of the men themselves was one which spoke of tidy, comfortable circumstances. Indiscriminate giving of beer for every conceivable job was formerly one of the curses of Warwickshire farming, and we were anxious to learn how far this bad system had given way before the new movement. In some cases we were glad to find it had been almost abolished, and in others that drink was only occasionally given at such times as haymaking and harvest. The general tenor of our information was, that less work was the rule for more money, and that there was scarcely that cheerful willing obedience to reasonable demands which used to distinguish the relations between men and masters; but, upon the whole, we did not find so great a change as might have been expected, and upon most of the farms we found many old labourers, who could scarcely fail to be interested in their employers' welfare.

At a time when tenant-right measures are receiving so much attention, perhaps I may be pardoned for alluding briefly to that matter. Custom has hitherto given no allowance for unexhausted improvements in this county, except in the matter of draining, in which case an allowance for five years has been general, a fifth part of the original cost being deducted for each year which has expired since the performance of the work. We were, however, pleased to find at the present time that, on the larger estates, the landlords, though contracting themselves out of the Agricultural Holdings Act, were giving fresh agreements to their tenants, providing ample and liberal compensation for unexhausted improvements. By the kindness of Mr. Donne, Lord Leigh's agent, we had an opportunity of seeing the new agreements prepared for the large estates of that nobleman, and we found the provisions all that could be desired on behalf of the tenant. Under them, the outgoing tenant is allowed one-third of the actual cost of the artificial foods consumed on the farm during the last year of tenancy, and one-fourth of that consumed the previous year. In the case of bones or lime applied to pasture, the full cost of the original application is allowed, less one-sixth for every entire year which has elapsed since such application. For the same manures applied to arable land the full cost, with a deduction of "a proportionate part thereof for each year the tenancy continues after the outlay." For superphosphate or other approved bought manure, applied during the last year of the tenancy to land from which no crop of corn or pulse has been taken, the entire cost, not exceeding 50*s.* per acre: for application to the farm of any other kind of manure, and for consumption of any other kind of food, full allowance in accordance with the provisions of the Agricultural Holdings Act; and for all arable land dead fallowed and clean, the last year's rent and rates, together with a due allowance for all reasonable labour expended thereon.

Mr. Randell, of Chadbury, has also introduced upon the Marquis of Hertford's estate, and upon the other extensive properties of which he has charge, a new form of agreement incorporating some of the principal features of the Bill, and giving compensation for unexhausted manures and foods; and it may safely be said that if these excellent examples are generally followed, the adoption of the Act in question will be rendered unnecessary, and that a fresh impetus will undoubtedly be given to the agriculture of the county.

I shall now proceed to describe in detail the management of the Prize Farms, only remarking that after our first inspection it became evident that we had at least three competitors whose cultivation was of a very first-rate character. The difficulty of an adjudication upon the respective merits of these became even more apparent after the May visit, and we therefore, shortly after that time, drew up a scale of marks for various points of excellence by which our award was finally made in July. I state this, because the competition being unusually severe, it is well that the public should know that we were guided by a definite principle: and that in a decision, which was not without difficulty, we were unanimous in our conclusions.

SCHEDULE OF FARMS ENTERED FOR THE WARWICKSHIRE FARM-PRIZE COMPETITION, 1876.

	Name and Address of Competitor.	Name and Address of Owner of Farm.	Size of Farm.		Nature of Soil and Subsoil, Described by Competitor.		REMARKS.
			Arable.	Pasture.			
			Acres.	Acres.			
1	John Caleb Adkins, Milcote, Stratford-on-Avon.	Hon. Mortimer Sackville West, Knole, Sevenoaks, Kent.	288	105	Mixed.	Variable, gravel, marl, and lias clay.	Special Prize of 25*l.*
2	John Lane, Broom Court, Alcester.	J. A. Sidebottom, Esq., Millbrook House, Hadfield, Manchester.	200	180	Mostly light.	Chiefly gravel, a little marl.	Second Prize, 50*l.*
3	Samuel Matthew Simpson, The Grange, Stoneleigh, Kenilworth.	The Right Hon. Lord Leigh, Stoneleigh Abbey.	237	183	Half-and-half.	Part clay, part gravel.	
4	Henry Stilgoe, Lower Clopton, Stratford-on-Avon.	Arthur Hodgson, Esq., Clopton House, Stratford-on-Avon.	333	150	Heavy.	Marl.	First Prize, 100*l.*
5	William Twycross Wakefield, Fletchamstead Hall, Coventry.	The Right Hon. Lord Leigh, Stoneleigh Abbey, Kenilworth.	218	242	Two-thirds heavy, remainder light.	Part clay, part gravel.	

MR. HENRY STILGOE'S FARM.

First Prize Farm.

Lower Clopton Farm, in the occupation of Mr. Henry Stilgoe, is situated about two miles north of Stratford-on-Avon, a short distance to the east of the turnpike-road leading from that town to Henley-in-Arden. It is under a little range of hills which near here rise from the valley of the Avon, and run in a north-westerly direction towards the village of Bearley, and whose escarpment forms the eastern boundary of the Clopton estate. The farm consists of 483 acres, of which 333 are arable and 150 pasture, and is the property of Arthur Hodgson, Esq., whose residence, Clopton House, is in the immediate vicinity, and the parks belonging to which are in the occupation of Mr. Stilgoe. The farm extends from the sides of the eminence above mentioned into the fertile and gently undulating plain which lies at the foot of the hill, and in which the town of Stratford rests. The New Red Sandstone in this neighbourhood gives way to the Lias; but Clopton Farm, though near their junction, is entirely upon the former formation. The soil is of the description which is locally known as "Marl," and is of a reddish colour, intermixed with smooth stones, with a stratum of blue marl a few inches beneath. Although of a somewhat heavy nature, it grows good roots, which are mainly fed upon the land—in some seasons, no doubt, with considerable difficulty.

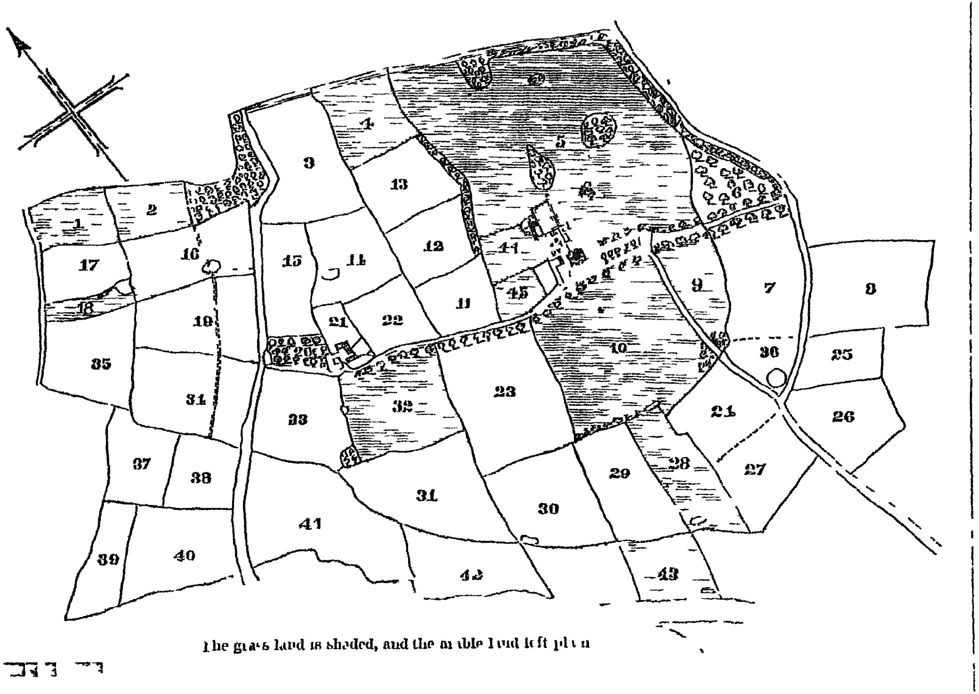
The farm is very compact, and lies entirely in a ring fence; but the arable and pasture lands are a good deal intermingled, as will be gathered from the plan (Fig. 1). The quality of the land varies, some of the arable being only moderate and some good; but its natural value is by no means equal to that of a great deal of this very fertile district. The pastures, although fairly good, are not remarkable, and a small portion on the hill-side is of very inferior character. The fields are large, and the fences, though somewhat irregular in outline, are clean, and well kept and trimmed.

The house and buildings are situated a short distance beyond Clopton House, the beautiful old residence of Mr. Hodgson, and by the side of the private road which runs from Stratford through the estate; and the occupation of the pretty park adjoining the mansion, added to the other ornamental features of the property, contributes materially to the pleasant character and aspect of the farm. The view from the higher grounds on the slope of the hill is very attractive, and embraces the whole of

Fig. 1.—*Plan of Clopton Farm, in the Occupation of Mr. H. Stilgoe.*

REFERENCE TO PLAN.

		A.	R.	P.
1	Old Hill Land	5	3	20
2	The Pasture Hill	5	2	28
3	Ash Park	15	2	17
4	Green Hill	6	3	28
5	Park	54	0	0
6	Orchard	6	0	0
7	Ground under Solisbury	15	0	0
8	Hadland's Hole	12	0	0
9	Front Meadow	15	0	0
10	Clopton Park	30	0	0
11	Little Willow Hill	6	1	10
12	Great Willows Hill	7	3	26
13	Stony Hill	9	2	39
14	Marlpit Ground	10	1	10
15	Long Ground	9	3	33
16	Clopton Road Ground	14	0	19
17	Dairy Ground	8	3	37
18	Paddock	1	2	0
19	Barn Ground	13	3	26
20	Orchard	2	2	36
21	Farmhouse, Yard, Barns, &c.	2	3	35
22	Clump Close	6	1	0
23	Hop Yard and New Ground	21	1	7
24	Fifth Ground	10	1	24
25	Wood's Close	6	0	0
6	Black Ground	10	3	24
27	Fourth Ground	9	3	27
28	The Mead	9	2	2
29	Windmill Hill	9	1	3
30	Oak Tree Ground	13	0	13
31	Floating Ground	16	2	22
32	Rick Yard Ground	12	3	8
33	Far House Ground	12	3	24
34	Lower Ground	16	3	8
35	House Ground	13	1	26
36	Three Corner Ground	3	1	0
37	Langley Grounds, No. 2	7	3	0
38	" No. 1	7	2	0
39	" No. 3	6	0	0
0	" No. 4	9	0	0
41	King's Lane Ground	17	2	4
42	The Old Garden	9	3	12
43	Devonport Meadow	6	1	0
44 } 45 }	Paddock occupied by Landlord	6	1	0



The grass land is shaded, and the arable land left plain the farm, together with the town of Stratford and surrounding country.

It should be mentioned that about 30 acres of land in the western corner are held on a yearly tenancy from Miss Mills, and that the eastern portion of the farm nearest the town of Stratford, including Clopton Park and about 47 acres of arable land, are also under a yearly agreement from Mr. Hodgson. The remainder, comprising the main portion of the farm, was taken under a lease of fourteen years in 1865, so that Mr. Stilgoe has only three years more of the lease unexpired. Within the first five years of the tenancy 160 acres were drained (the landlord finding tiles, according to the lease), at a cost of 3*l.* per acre. The drains were laid at a distance of 12 yards and at a depth of 3 feet, and so far have been very successful. In addition to the considerable outlay entailed by this work, Mr. Stilgoe filled up many pits and grubbed a great number of hedges, thus altering very much the appearance of the farm, and improving its capabilities for profitable cultivation.

There are no restrictions as to cultivation, and the privilege of selling hay and straw is conceded to the tenant by the terms of the agreement, excepting during the last year of tenancy. Hay is not sold, but Mr. Stilgoe has been accustomed to sell straw to some extent in order to recoup himself for the outlay on stable-manure, mentioned below. A large quantity of this is annually brought from Stratford. In the first ten years of his tenancy Mr. Stilgoe spent 1039*l.* in this way, and a further sum of 174*l.* was in the same period spent in lime. We noticed, however, that the outlay on lime had ceased, though that on stable-manure still continues.

The buildings near the house, which were up to that time insufficient for the accommodation of the stock, were last year remodelled or reconstructed at a cost of about 900*l.*, upon which sum the tenant pays 5 per cent. as additional rent. They are now of a capital substantial and roomy character, containing good feeding-sheds, calf-pens, and other necessary adjuncts. Water is laid on from the hill above to every part of them, the cost being included in the above sum. In addition to this homestead there are two other very useful sets of cattle-yards, with barns, &c., at opposite extremities of the farm.

Grass Land.—Of the 150 acres of grass land on the farm, about 84 acres are occupied by the two parks at the front and rear of Clopton House, and a further 6 acres by an orchard adjoining the latter. The quality of most of this land is fair, and it is grazed with mixed cattle and sheep. The three pieces on the hill-side have been already mentioned as inferior. The remaining grass land is scattered, some portion of it lying near the house, and the rest, consisting of meadows which are generally mown, lies on the lowest land at the bottom of the farm. The mowing land—about 24 acres—is manured every year with a good dressing of farmyard or Stratford stable-manure, and is thus kept in a satisfactory condition.

I shall, in the first place, describe the system of cultivation adopted, passing on afterwards to the Live stock, the management of which is very excellent. The cropping is generally upon the six-course rotation common to this county, viz.:—(1) Swedes, Mangolds, or (very rarely) Turnips; (2) Barley; (3) Seeds; (4) Wheat; (5) Beans or Peas; (6) Wheat or Barley.

This course is, however, occasionally varied, about 20 acres of seeds on the poorest land being allowed to remain two years down, and being mowed the first and grazed the second year. Under this system the following is the usual acreage of the various crops:—(1) Wheat, 85 to 100 acres; (2) Barley or Oats, 40 acres; (3) Beans or Peas, 40 acres; (4) Seeds, mowing or grazing, 60 or 70 acres; (5) Roots, 40 acres, consisting of Swedes 30 acres, Mangolds 10 acres. Besides the above crops, about 8 acres of land are always kept under Lucerne.

Commencing with the fallow land, the usual practice is as follows:—The wheat-stubbles having been carefully forked over, the land is manured as early as possible with 15 loads an acre of good farmyard-dung, and ploughed immediately. In the case of mangolds they are drilled, if possible, the first week in April at a distance of 22 inches apart, 8 lbs. of seed being put on per acre. They receive an extra dressing of 2 cwt. of nitrate of soda per acre directly after chopping out, and the horse-hoe is immediately afterwards passed through them. Half the crop is fed on the land and half carted away for cattle in the yards. The crop of 1875, which the Judges saw, being clamped in the field (the weather being too wet for carting them away), was a superb one, not only in the quantity but also in the quality of the roots. The sort was Sutton's Golden Tankard, and the shape and size of the roots was almost faultless. As far as the weight per acre went, it has no doubt often been exceeded on some descriptions of land. It was, however, so good and level a crop that, at the request of the Judges, Mr. Stilgoe weighed a certain quantity, which gave an average of 47 tons per acre. In May and also in July we had further opportunities of observing their keeping qualities, and found them surprisingly firm and juicy. The cost of hoeing, singling, and cleaning this crop is about 12*s.* per acre; and the expense of taking up and throwing into heaps, containing about a ton each, is also 12*s.* The earthing down of the crop last year was put out at 1½*d.* a heap, each heap averaging somewhat more than a ton.

Swedes.—The land intended for swedes is treated in a precisely similar manner to that for mangolds, described above; but, of course, they get no top-dressing. They are drilled as early as the second week in April upon the flat, at a distance of 22 inches, with the dry drill, and without artificial manure. The quality of the roots is excellent, but there is very often some difficulty in feeding them off. Two-thirds of this crop is fed on the land, and the remainder carted off. It must be understood that, under no circumstances, are two ploughings given to the land for this or other crops.

Barley.—The barley crop follows the swedes and mangolds. About 2½ to 3 bushels is the quantity usually sown. The barley is weeded by women and cut by machine. The quality is very good generally, and Mr. Stilgoe took the first prize for the best sample of barley at the Warwickshire Show in 1874. Seeds are sown among it, Sutton's mixture having been frequently used. The seeds this year contained, in our opinion, too large a mixture of grasses, and hardly sufficient clover-seeds; and, although a capital plant, was hardly equal, on that account, to some of those in the neighbourhood. We suggested that "Stilgoe's mixture" should have a trial, and were glad to find in May that our hint had been adopted, and that 14 lbs. of mixed clovers and a peck of rye-grass had been sown among the barley.

A proportion, varying with the necessities of the farm but averaging about 30 acres, of the seeds are mown, and the remainder grazed with sheep; and, as has been stated, about 20 acres are allowed to remain down the second year, partly for the purpose of improving the poorer portions of the farm and partly to enable the ewe flock to be kept entirely at home, as keeping is never taken off the farm. The grazed seeds have a good quantity of cake or corn consumed upon them by the sheep, and the second year's seeds are broken up by the steam-plough, in either July or August, for wheat.

Wheat is sown as early as circumstances will permit, generally at the middle or end of October, or the beginning of November. The Kentish High Back seems to be the sort generally preferred. About 7 pecks per acre (or occasionally 2 bushels) is the quantity of seed used. The wheat is always harrowed, and carefully hand-hoed at a cost of 5*s.* per acre. The cutting is, if possible, done by machine; but on this land (being rather subject to go down) this is not always practicable; and last year, being much knocked about, as much as 20*s.* to 25*s.* an acre was paid for reaping it by hand.

Beans or *peas* follow the wheat, the land being again manured for these crops at the rate of 12 or 14 loads an acre. The beans (White Eye or Heligoland) are drilled at a distance of 14 inches apart, and at the rate of 2½ bushels an acre. They are hoed with hoes, 11 inches wide, at a cost of 4*s.* an acre, and the work seemed admirably done. Peas are sown at the rate of 5 bushels—"Nimble Tailors," or some other early variety of the white kind, being chosen. In hoeing beans, peas, and other crops, Mr. Stilgoe gives his men 1*d.* a score for docks, which they bring home in bundles for burning. Wheat (or occasionally barley) follows the pulse-crop and concludes the rotation.

The following is the cropping-list for this and last year:—

1875.	Acres.	1876.	Acres.
Wheat	103	Wheat	93
Barley	50	Barley	40
Beans	31	Oats	19
Peas	21	Beans	32
First year's seeds	53 {34 mown. 19 grazed.	Peas	14
Second year's seeds	20 grazed.	First year's seeds	60 {32 mown. 28 grazed.
Mangolds	8	Second year's seeds	20 grazed.
Swedes	20	Mangolds	12
Cabbages	2	Swedes	31
Rape	6	Lucerne	8
Turnips	7		
Lucerne	8		

First Inspection, November 11.—As has been previously mentioned, our first inspection took place after a perfect deluge of rain which fell on the night of the 9th, and which caused a very heavy flood in the Avon. No wheat had been planted on the farm with the exception of that after two years' seeds, steam-ploughed early. The preparation of the other wheat-land was very forward, the steam-plough having been brought into requisition on other portions of the farm; but the land was too wet for present planting. The depth ploughed was about 7 or 8 inches, and in many places the blue marl, which underlies the soil here, had been brought up by the plough. The mangolds were all taken up, and were being pitted in the field. The tegs were already on swedes, and looked well, though the land was very dirty. Some good shearling sheep were on rape, and eating 1 pint of beans, 1 pint of grains, malt-dust, and chaff; 179 tegs were alive from 140 ewes put to the ram. The wheat-stubbles were being ploughed for the fallow-crops, and were beautifully clean. Four horses at length were ploughing about 7 inches in depth. The horses, of which nine only are kept, were capital animals, in good condition, and were eating 1 bushel of beans a week, and clover hay, without stint. After December 1st their keep is changed to ½ bushel of beans, 1 bushel of oats, and some roots in addition to the clover. Eight feeding steers were in the stalls, and were getting 8 lbs. of cake a day, ½ peck of meal, and a bushel of swedes. A very good cow was feeding for the Stratford Christmas Show. This was a fine animal, bred by Mr. S. Canning, and had reared three calves. She afterwards took the first prize at Stratford, and fetched 55*l*. The cattle were for the most part in the yards, where they were getting 2 lbs. of cake, and barley-straw and roots according to size and condition. Some splendid Oxford Down wethers, bred upon the farm, were being prepared for the Christmas Shows. They took the first prize at Stratford, and it is understood that they turned out magnificent sheep, some of them weighing as much as 55 lbs. a quarter.

Second Inspection.—In May we found the lambs already weaned, and comfortably settled on seeds; a very even good lot, the singles and couples being still kept separate. They were getting 2 ounces of Watkins's corn-cake, and as many malt-cooms as they would eat. There was not a dirty lamb in the lot, and their appearance showed excellent management. They had all been drenched at weaning time (a few days previous) with a mixture of a dessert spoonful of turpentine and 1¼ pint of strong lime-water, and Mr. Stilgoe said this dose had caused them to void large numbers of worms. The ewes were running in the Deer Park (at the back of Clopton House), and looked healthy and in good condition. Sixteen ram tegs selected from the flock were on seeds, and getting 1 pint of Indian corn and ¼ lb. of corn-cake; 190 lambs were now alive from 140 ewes put to the ram. Tegs were being clipped weekly for the Stratford Market, and those sold the previous week had averaged 70*s*. The feeding tegs had now been removed from swede-land to a small piece of stubble intended for turnips, and were getting 1 pint of Indian corn and ¼ lb. of cake, with some malt-dust, and unlimited cut mangolds. The average price of some we saw under the clipper's hands was 75*s*. at the next market. The ewe tegs for addition to the flock were a capital lot. The cattle were all out to grass, and were in good condition and thriving.

The wheat had all been got in shortly after our last inspection, and although of rather a light colour for the most part, looked healthy and promising for the season, That after beans sown with 7 pecks an acre seemed at this time the best. It had all been harrowed, but very little of it hoed. The barley was backward, but a good plant. Oats after turnips and rape, and a second piece after peas (sown at the rate of 5 bushels an acre), looked well. Beans were very fine, and were being hoed in capital style, at a cost of 4*s.* per acre. The peas also were very healthy, and, although not hoed, seemed absolutely free from almost every kind of weed. Seeds for mowing and for grazing were both very good; mangolds were just coming up, and some portion of the land was just ready for sowing swedes. Lucerne was fit to cut.

July Inspection.—At our July visit the farm presented altogether a very satisfactory appearance. Peas were ripe, and cutting about to begin. The crop was very fine, and almost absolutely clean. Lucerne, now in the second cut for horses, was first-rate, and also perfectly clean. The barley was, for the most part, very good, especially considering the unfavourable winter and seed time for this description of land. The wheat gave promise of an excellent crop. It hardly stood as stiff as some we had already seen, but the ear was well filled, and there was every promise of a large yield. Some of it we estimated at fully 48 bushels an acre. The beans were very clean, and capitally hung, the leaf just showing signs of dropping. The seeds after mowing were suffering somewhat from the drought and heat, as also were the swedes; but the mangolds, though a little gappy, like all the rest we saw, were very thriving. The two pieces of oats were fair, but the land can hardly be considered suitable for this crop.

The 125 stock ewes were upon the second year's seeds, which were just ready to steam-plough for wheat. They were very even and "sorty," and in beautiful condition. The lambs, 186 in number, were on seeds. They looked very healthy, and were full of condition. Thirteen shearling rams were getting 1 lb. of cake, 1 pint of maize, and what malt-dust they liked in the meadow eddish. They had grown into excellent sheep, and would, no doubt, fetch satisfactory prices in the neighbourhood. The 42 theaves intended for addition to the flock were level, capital sheep, with a good deal of character and style. About 130 sheep, bought in for the purpose of grazing, were running in Clopton Parks, and many of them were about fit for the butcher. They were getting corn and cake on the pastures.

The cattle scattered about over the farm were of a very useful character, and had grown and thriven surprisingly since our first and second inspections. Some in the Park were very full of condition, and would soon be ready for market.

Mr. Stilgoe had already put his harvest out to his labourers to cut and get into stack, at a cost of 15*s.* per acre (a machine being provided), with an allowance of beer; so that all anxiety on that score was off his mind.

Live Stock.—About 80 head of cattle and 600 sheep are usually kept on the farm. No stock is sold off in a store state, but all are finished for the butcher. The management of the stock is admirable.

Cattle.—About 46 beasts are annually fattened. The herd consists of about 8 dairy cows of the Shorthorn breed, and from these about 20 calves, 12 of which are bought in for the purpose, are reared every year. The system by which this is accomplished is as follows:—The calves are weaned at three months, up to which time they receive as much milk as possible, supplemented by linseed-porridge. After weaning they get 1 lb. of linseed-cake a day, together with an allowance of barley-meal and grain, until they are one year old, when they are put in the yards or pastures, and kept in a thriving state in the ordinary way.

Mr. Stilgoe, a short time back, crossed his cattle with a Longhorn bull, but, not getting the benefit which he expected to derive, he (very wisely in the Judges' opinion) reverted to the pure bred Shorthorn, and has now in service a very useful bull of the well-known "Walnut" family, and a youngster, also of pure blood, growing up, who promises well for future service. The cattle, like the sheep, are never sold as stores, but all made off the farm in the shape of meat. The general character of this stock is good. The cows are large, good-framed animals, selected with an eye to dairy purposes, and combine capital flesh with milking properties; and it is no doubt with the same object that a bull has been selected from a tribe which has always been famous for the combination of these qualities.

The following was the stock of cattle upon the farm at the date of our three inspections:—

	November.	May.	July.
Dairy cows	7	8	8
Feeding beasts	14	24	26
Calving heifers	4	..	4
Yearlings	25	19	19
Calves	19	18	20
Bulls	1	1	1
Show beast	1	..	1
	71	70	79

Sheep.—The sheep bred upon the farm are of the Oxford Down breed, and (as has been observed) show great character and quality. The flock of ewes numbers 140, of which 40 are theaves (or shearlings), which are drafted in every year. The ewes are put to the ram early in September, and lambing commences the first week in February. The sheep are prolific, and the produce this year consisted at weaning time of 190 lambs in very healthy condition. Not a single casualty occurred at lambing time in the spring of the present year, although 3 ewes unfortunately died in the winter. The lambs are weaned very early, as I have before noticed, and, after being drenched as described above, are settled on the young seeds, when they soon begin to eat Watkins's corn-cake, malt-dust, or other artificial food.

Mr. Stilgoe is very particular that the lambs, under no circumstances, follow old sheep on the seeds or pastures; and to this precaution he probably owes some of his success as a breeder.

About October the lambs go on swedes which are cut for them; their allowance now is 2 ounces cake, some malt-dust, and a pint of grains a day. (The latter, being easily obtainable from the large breweries at Stratford, are somewhat largely consumed on Clopton Farm.) This allowance is gradually increased as the winter comes on and spring approaches; and in May we found the tegs eating 1 pint of maize, ¼ lb. of linseed-cake, and a small quantity of malt-dust, besides unlimited cut mangolds (the swedes being by that time finished). This apparent prodigality of food is amply justified by the results. All the lambs put on turnips are expected to be sold off fat as tegs, with the exception of the ewe tegs for breeding purposes, and about 15 ram tegs selected with the same object. The harvest time has now come, and the crop should be uniformly ripe. A lot of grand sheep now leave the clipper's hands every week, and we had the pleasure of seeing in May some tegs, which at the following market made 85*s.* 6*d.* each out of the wool. The wool averages 8 lbs. a fleece.

Sheep are bought in regularly for grazing according to the capabilities of the farm, and sold off fat; and altogether from 500 to 600 sheep per annum find their way to the butcher. A stock-book is kept, and notes compared with the shepherd on the first of each month.

Mr. Stilgoe is a frequent competitor with a few picked wethers of his own breed, at the Exhibitions of the Midland Counties, and can generally show a few of these fine sheep, which, for size, quality, and evenness of feeding, are not easily excelled. At Christmas, 1874, he took the first prize for the best pen of short-woolled sheep at the Stratford Show. These sheep also took the Town Cup for the best pen in any of the classes. They realised 6*l.* 2*s.* 6*d.* each. The stock of sheep upon the farm at the time of our three inspections was as follows:—

	November, 1875	May, 1876.	July, 1876.
Stock rams	3	3	2
„ ewes	140	136	125
Shearling sheep	87	..	127
Tegs	..	300	..
Show sheep	7	..	Theaves for flock 43
Lambs	179	190	186
	416	629	483

At our first inspection we saw the flock to disadvantage. Foot-and-mouth disease and scab had both been prevalent among the sheep. The winter, also, on this description of land was very trying for them; but at our May visit we were able to congratulate Mr. Stilgoe on a triumphant mastery of his difficulties, and the excellent character and capital management of his sheep became more apparent as we became more acquainted with them.

Horses.—The general economy of the work of the farm is admirably exemplified in the horses. Only 9 working horses are kept, and these, with occasional help from a Fowler's Double-Engine Plough, which is used for breaking up second-year's seeds, do the whole work of 333 acres of arable land. The horses are capital powerful animals, and are bought in at the age of two years, worked generally till they are seven, and sold at a high price. Two horses are sold off the farm every year at this age. Ploughing is always performed with four horses at length in the winter, and with three in the spring. The winter keep of the horses has been given. In summer they get lucerne, and a small quantity of corn, beans, or oats.

Swine.—Four sows of the large white sort are kept, and their produce disposed of as soon as they will fetch 20*s*. each in the market.

Artificial Foods and Manures.—The consumption of artificial food upon the farm from April 1875 to April 1876 was as follows:—

10 tons linseed-cake.
6 „ Watkins's corn-cake.
2 „ cotton-cake.
4 „ malt-dust.
20 sacks meal.
40 qrs. oats.
10 qrs. maize.
3900 bushels grains.

All these are purchased, but, in addition, the following quantities of food grown on the farm were consumed:—75 quarters of beans and 30 quarters of barley. The whole consumption of artificial manure was 17 cwts. of nitrate of soda for the mangolds. The total value of foods and manures used on the farm was 581*l.* 18*s.*, or, excluding the home-grown produce, the total cost of bought foods and manures was 383*l.* 18*s.*

Labour.—There are nine capital labourers' cottages on the farm, all of which are occupied by regular labourers, and to this happy circumstance may perhaps be attributed some of Mr. Stilgoe's business successes. The occupants of these cottages are the following hands:—

1. *Shepherd.*—Wages 17*s.* a week; cottage rent free; 2*l.* for lambing; 3*s.* per score shearing and winding wool. The same as the rest of the men during harvest month.

2. *Carter.*—Wages 17*s.* a week; cottage rent free; 3*d.* per load for taking out corn; 3*d.* per acre for all corn drilled, "if done well;" 3*d.* per acre for mowing grass and clover with machine; and takes share with other men in harvest month.

3. *Under Carter.*—Strong lad, 8*s.* a week; 8*l.* at Michaelmas; 3*d.* per load for taking out corn.

4. *Cowman.*—Wages 17*s.* a week; cottage rent free. Same as other men in harvest month.

5. *Groom, Gardener, and Poultry man.*—Wages 17*s.* a week; cottage rent free; harvest wages as cowman, &c.

6, 7. *Under Shepherds.*—Wages 16*s.* a week and cottages rent free. These men have to assist the shepherd all the winter months and work as labourers, at 15*s.* all the summer; but piece work is given them at that time to a great extent.

8. *Granary Man and Rough Carpenter.*—Wages 16*s.* a week; cottage rent free. Cattle and poultry to serve in yard adjoining cottage. Same as other men in harvest month.

9, 10. *Labourers.*—Cottages rent free and ordinary labourers wages, 15*s.*, with harvest privileges, &c.

There are generally 15 men, 3 boys, and 6 women in employment. The ordinary price of labour is 15*s.* a week. In hay-time 18*s.* a week and three quarts of beer a day. All the hay is done by piece-work. Harvest let to tie, carry, and stack at a cost of 15*s.* an acre, with a gallon of beer a man a day. Boys get 5*s.* and 4*s.*, with double wages in harvest, and 2 quarts of beer a day. Women, standing wages 10*d.* per diem, with 1 quart of beer for haymaking and tea sent into field at 5 o'clock; 2*s.* 6*d.* a day for harvest-work, with 2 quarts of beer a day. Two or three Irishmen are in the habit of coming regularly for a few months in the summer, and other labour is seldom required upon the farm, except at odd times, threshing, &c.

The cost of labour for the last five years has been as follows:—

	£	*s.*	*d.*
April, 1871–2	804	2	0
„ 1872–3	819	4	3½
„ 1873–4	896	6	8½
„ 1874–5	850	12	0
„ 1875–6	866	10	3

The average has, therefore, been 847*l.* 7*s.*, or 1*l.* 15*s.* per acre upon the whole area of the farm. Reckoning, however, for the sake of convenience, the cost of labour on grass land at 10*s.* per acre, the average cost upon the arable land has amounted to 2*l.* 6*s.* 6*d.* per acre.

Considering the fine condition of the farm, coupled with the nature of the soil, and its almost perfect cleanliness, the labour bill must be considered a very moderate one, and this circumstance, taken in connection with the great economy shown in the horse-labour of the farm, had its due weight with the Judges in determining their decision. It must be understood that this is not a farm for the display of a system of catch cropping, such as that adopted by Mr. Lane, and so successfully carried out by him, as described further on. Neither is it, indeed, according to the ordinary acceptation of the term, "a sheep farm." A strong loam, which requires draining, and is essentially of the "wheat and bean" description of land, would daunt many farmers whose object was sheep-breeding; yet without a flock we venture to think that Mr. Stilgoe would be unable to pay his rent. The simple question is, under what system can a high rent be best paid on this description of land and a good margin of profit secured? Mr. Stilgoe answers this question by growing corn crops, of the excellence of which there can be no question, and by a production of stock (or, in other words, of meat and wool) equal to 3*l.* 10*s.* per acre, reckoned upon the entire acreage of the farm. I have not time or space to go into statistics, but it must be evident how great our gain as a nation would be were this example more generally followed.

It was clear to us at each succeeding inspection of this farm, that, notwithstanding the trials of a most unfavourable season, Mr. Stilgoe, by sheer dint of good management, had secured crops, which, if not superior to those of his more favoured competitors, would fairly compare with the best of them; and that in every department his practical character and business qualities were displayed. His sheep struck us as of unusual excellence, and their management from first to last as characterised by great judgment. A judicious mixture of breeding and feeding carried out with care in every detail secures results in his stock which must be looked upon as very satisfactory; while his able management of plough-land is exhibited as much in the crops which adorn his fields as in the figures which I have given above. In this fertile neighbourhood, his land cannot be looked upon as of the best description, yet it is clear that it is made to contribute a very large amount of food for the benefit of the nation. At the same time its permanent value has no doubt been greatly increased, and its employment of labour perhaps nearly doubled, with a profit to all concerned.

Mr. Stilgoe's relations with his labourers seem of a most admirable character. The cottages are pretty, neat, and with a good garden attached to each. His men, notwithstanding the upstir of recent years, have nearly all remained with him since he entered on the farm; and this circumstance will, perhaps, more than any other, testify to the esteem in which he is held as a kind and liberal master. If we have one little criticism to offer on this department, it is on the quantity of beer allowed in hay time and harvest. A gallon of beer a day for men and half-a-gallon for women and children, seems an excessive quantity to squander in drink, and it will, no doubt, be to the advantage of the labourers themselves when it is found practicable to commute this system into a money payment.

To conclude with a brief summary of what we found at Lower Clopton:—A perfectly clean farm, well horsed, well manned, well cropped, and well *mastered*. Economical (though by no means stingy) management visible everywhere. Difficulties of season and of soil triumphantly overcome. Labourers well paid, well housed, comfortable, tidy, and interested in their master's success. A business-like *system*, extending to the smallest details of the farm-management; and last, but not least, a production of meat and grain which few farms of the same quality can rival or excel.

It should be mentioned that Mr. Stilgoe keeps no bailiff, and is therefore himself responsible for the conduct of the business, in all its branches.

The farm accounts are most accurately and carefully kept, and every information we required was readily forthcoming. Ample testimony was therefore afforded us, in addition to that of ocular evidence, that all the conditions required by the Society, and especially that important one of "General Management with a view to Profit," were amply fulfilled.

It would be most unjust, as well as ungallant, to conclude this Report without an allusion to those matters of more purely domestic management in which Mrs. Stilgoe's co-operation is visible. The pleasant, roomy house at Lower Clopton and its surroundings bear distinct evidences of feminine care and industry; and its pretty trimly kept garden, its poultry pens, with their numerous occupants of the pure Dorking variety; and its beautifully kept and managed dairy, all correspond with the more important features of the farm, and harmoniously combine to fill up the picture of order, of neatness, and of judicious and profitable management, which would be incomplete were it not extended to these minor matters.

MR. LANE'S FARM.

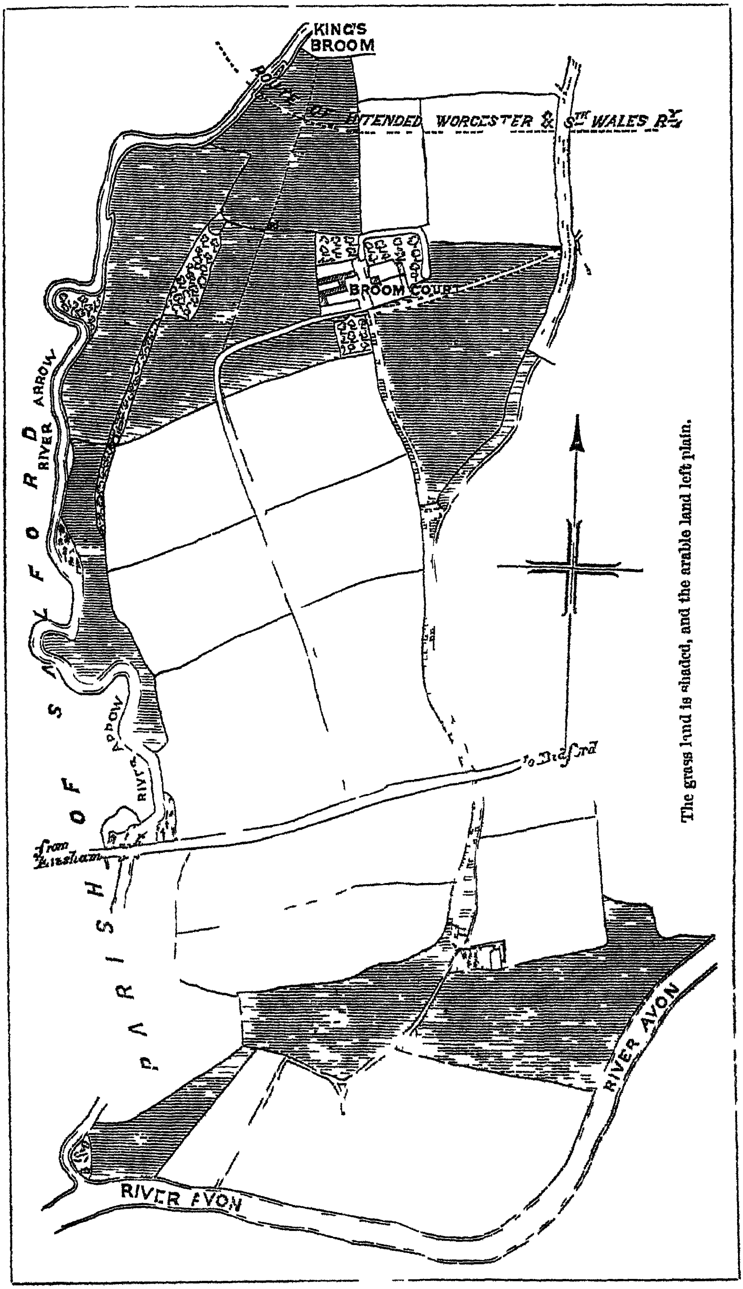
Second Prize Farm.

Broom Court, Mr. Lane's farm, and the property of Mr. J. A. Sidebottom, of Millbrook House, Hadfield, Manchester, is situated very near the south-western border of the county, where it abuts upon Worcestershire, and is about 4 miles south of Alcester, and 10 miles west of Stratford-on-Avon. It is intersected from west to east by the road leading from the village of Bidford to that of Salford Priors, at which place, and at a distance of about a mile and a quarter from Broom Court, there is a station on the Birmingham, Evesham, and Ashchurch branch of the Midland Railway. The small river Arrow (a tributary of the Avon) forms the western boundary of the farm; and the Avon itself bounds it on the south, and separates it from Worcestershire.

The farm consists of 200 acres of arable land and 180 acres of pasture. The plough land occupies the ridge and slopes, both east and west, of a gentle elevation, which rises from the banks of the Arrow, and runs almost due north and south, following the course of that stream. The grass land consists of the meadows immediately adjoining the river, and also of some useful upland pasture in the vicinity of the house, which is placed nearly at the northern end of the occupation. The farm is compact and manageable, the arable lands (with the exception of two fields at the back of the residence) being entirely contiguous, and enjoying the advantage of a capital farm road, which, running along the crown of the above-mentioned ridge, divides the major portion of the plough land into two pretty equal moieties; and commands, from its elevation, not only a complete survey of the lands which form its slopes (and indeed of the whole farm), but also a pleasing panorama of the country for many miles round; bounded in a westerly direction by the Bredon, Cotswold, and other Worcestershire hills, including the Malvern range in the dim distance.

The farm is upon the New Red Sandstone formation, and the land mostly consists of a brown gravelly loam, varying in depth and quality; tolerably easy of culture, and liable, from its gravelly character, to suffer somewhat in periods of protracted drought. A very small portion is of a somewhat stiffer sort, being of the "marly" nature common to the formation; and, owing to its distinct character, it is often planted with beans, out of course, instead of roots, it being difficult, except in very favourable seasons, to obtain a plant of the latter. The meadows are subject to floods (about 20 acres of hay were swept away in

Fig. 2.—*Plan of Broom Court Farm, in the Occupation of Mr. J. Lane.*



The grass land is shaded, and the arable land left plain.

1875, and much of the land flooded for months), but in other respects are very useful pastures; some of them of sufficient quality to feed cattle, and others which are mown for hay. The grass fields near the house are of the same character as the arable lands, and are therefore rather liable to "burn" in a hot or very dry summer.

The old mansion of Broom Court, the seat of the families of Sir E. Burnell, and afterwards of Sir Humphry Clarke and Sir Thomas Skipwith, has long disappeared, but traces still remain of its fosse and moat, &c. The present residence, which occupies its site, is a comfortable structure, suitable to the wants of the farm, and pleasantly surrounded with well-timbered pastures. The buildings are of a very useful character, and comprise all requisites for the successful cultivation of the land. Water is laid on all over them, including the feeding-sheds, by a pump and ball-tap.

Mr. Lane has occupied his farm for about twenty years, and has at present a lease, of which five years are unexpired. He is restricted from growing two white straw crops in succession. Straw and hay may, however, be sold off the farm, provided all the money so obtained is expended on artificial foods and manures.

Mr. Lane's course of cropping can hardly correctly be described as the six course, although that is the foundation of his system. When, however, it is stated that on 200 acres of arable land he grows, in addition to about 100 acres of white straw crops, and 66 acres of pulse crops and seeds, as many as 80 acres (occasionally) of roots (not reckoning stubble turnips), it will at once be seen that there is a peculiarity of management which requires some explanation; that peculiarity consists (in a few words) in interpolating *between the pulse and the following crops*, and also on a portion of the seed land, a crop of roots; a "catch crop," cultivated, however, in no ordinary way, but on a plan which reflects the greatest credit on Mr. Lane, who, in common with some other agriculturists in this district, has successfully pursued it for several years. I shall go somewhat fully into this system, because it is a deeply interesting one for farmers in many parts of England, and one which may doubtless be advantageously followed elsewhere. It will only be necessary for me to indicate the normal sequence of crops on the farm.

1. Fallow. Roots, nearly all mangolds.
2. Corn. Barley, or occasionally spring wheat.
3. Seeds. Clover seeds.
4. Corn. Wheat.
5. Pulse. Beans or peas *with extra crops.*
6. Corn. Wheat or oats.

The above list offers no remarkable features, and is intended simply as an introduction to some description of the management of the "*extra crops*," as I prefer to call them. It may, however, be convenient to follow the general management of the land, and to describe these crops in due course.

Fallow.—The wheat stubbles, after being carefully forked over in the autumn, are manured with 11 or 12 loads of farmyard muck per acre, and receive their *one* ploughing as soon as convenient. Early in April the mangolds are drilled at the rate of 6 lbs. per acre, and 24 inches apart; 2 cwt. of bone superphosphate being applied with the liquid-manure drill, and a further 2 cwt. sown broadcast at the same time. The after cultivation of this crop does not require any description, but the excellent nature of Mr. Lane's management may be judged from the fact that last autumn he took the prize offered by Messrs. Webb, of Worcester, for the heaviest crop of mangolds grown with their manure; and that the Judges appointed to superintend the competition ascertained that the quantity actually grown by him amounted to 49 tons 7 cwt. 2 qrs. per acre. The sort was Long Red, and the roots were carefully topped and cleaned before measurement. A fine sort of Yellow Globe, however, is more generally grown, and if it scarcely produces so heavy a weight per acre, it seems to make up in quality for any deficiency of that kind. After an inspection of the very fine crops of mangolds which we saw in November last, we could not doubt that Mr. Lane exercises a very wise discretion in appropriating nearly the whole of the fallow break to this useful root. About two-thirds of the crop is fed upon the land with sheep, and the remainder consumed by cattle in the yards.

The swedes are cultivated in much the same manner. Only one ploughing is allowed, except in very rare cases; and the land is treated with the same quantity of muck. About the middle of May they are drilled on the flat, about 2 cwt. per acre of Lawes' or Webb's bone manure being put in by the water-drill with the seed. Only about 5 or 6 acres are generally sown, and about half the crop is drawn off for the use of the ewes at lambing time.

A small portion (about 4 acres) of this break is appropriated to vetches, for early use in the spring; and the following is the seeding generally adopted:—1st acre, 1 bushel rye and 2 of vetches; 2nd acre, 1 bushel winter oats and 2 of vetches; 3rd and 4th acres, 3 bushels of vetches each. This land is afterwards broken up and sown with turnips, "Imperial Green Globe," from selected and self-raised bulbs, being the sort preferred.

Barley, which follows the root-crops, is sown from the end of February to the end of March, from 6 to 8 pecks per acre being the usual seeding. Hallett's Pedigree is the favourite kind; and at the proper time the land is seeded down with clovers. In 1875, which we have had occasion to refer to as so disastrous a year on the generality of farms, Mr. Lane was fortunate enough to secure a crop of barley which yielded, on the average, 52 bushels, and produced 12*l.* 7*s.* per acre.

Seeds.—10 lbs. of red clover, 2 lbs. of white Dutch, 1 lb. of alsike, and 1 gallon of perennial rye-grass, is the mixture usually sown, and apparently with much success. The crops of seeds were this season so universally good in plant, that on the different farms we visited it was somewhat difficult to select the finest; but in Mr. Lane's case we possess evidence of a crop grown *last* year, which can only be described as astonishing. To secure, in one of the rainiest summers ever remembered, two cuttings of clover in such fine condition that the hay should be worth 30*l.* per acre in the market, is a feat, we think, not often accomplished. Yet this was actually done at Broom Court in 1875! On our first visit to his farm in November, Mr. Lane called our attention to four ricks of clover standing in his yard, which were the produce of 17 acres of land from two cuttings. These ricks he estimated at about 80 tons; and a rough measurement convinced us that, at any rate, he had not very greatly exaggerated their contents. Having informed us that the clover was carried in such fine condition that it was available for sale, and that he would probably so dispose of it, it occurred, shortly afterwards, to the writer of this Report, that it would be wise to ascertain, as accurately as possible, the actual quantity and value of these ricks. With this view, Mr. Holtom, one of the Judges, who lives at no great distance from Broom Court, undertook to make a careful measurement of the ricks, and we were thus able to form (in connection with the information afforded us by Mr. Lane) an approximate estimate of their worth.

At the May inspection nearly the whole of the four ricks had been disposed of, and we satisfied ourselves that about 72 tons of clover had been cut from 17 acres, and that a considerable quantity had been sold to go to Birmingham at the high price of 7*l.* 10*s.* per ton, the purchaser paying railway charges. The total value of the crop was estimated at 504*l.* One of the ricks remaining in cut (a fresh consignment having been ordered away), the Judges had an opportunity of examining the quality of the hay, and found it green in colour, full of leaf, "nosey," and altogether most excellent in condition. It was evident that it must have been handled with much care and judgment, and it reflected the greatest credit upon those responsible for its management. A season of unusual growth had, no doubt, contributed materially to the grand result of $4\frac{1}{4}$ tons of saleable hay per acre; but something more than ordinary care must have been exhibited in the saving of the crop, and something more than ordinary treatment in the preparation of the land. On inquiry we found that the crop had been dressed early in the season with the manure-soakage and waste earth, which is one of the specialities of Mr. Lane's farming, and the preparation of which I may as well here describe.

A tank adjoining the farm-buildings, which are all spouted, receives the soakage of the yards. In winter, waste earth from various sources is diligently collected, hedge-clippings and other refuse contributing to the store, and the liquid manure is then pumped on to and thoroughly mixed with these matters, a very valuable compost being the result. The matter is not without consequence, as exhibiting the systematic economy which pervades the management of the farm, and contributes so much to Mr. Lane's success in business.

A portion of the seed-land is broken up early, after having had mangolds and cake consumed upon it by sheep, and planted with swedes. They are sown with the water-drill, and get 2 cwt. per acre of Webb's or other superphosphate.

Wheat follows the seed-shift and is drilled early in November, at the rate of 5 or 6 pecks an acre. It is invariably harrowed, and hoed when necessary, which is not always the case after clover-seeds. The small quantity of seed gives ample plant, and although on the 12th of November (owing to the wetness of the season) sowing had not commenced, it was not thought necessary, in consequence of this delay, to increase the quantity of seed, and in May the wheat was well planted and promising in appearance.

The Pulse Crop is next in order, and with it begins the most noticeable feature of Mr. Lane's management, and one which is carried out with such admirable method as to deserve the attentive consideration of the agricultural world. On the portion of this course which is allotted to beans (generally about 35 acres) the winter variety is *invariably* sown, the land having previously received a dressing of 12 one-horse loads per acre of farmyard-manure. The beans are planted early in November after one ploughing, 2 bushels an acre being drilled in double rows, 9 inches apart; the distance between each double row is 27 inches. Thirty-one inches was formerly the width adopted, but some difficulty was experienced in cutting them properly with the reaper at this width, and they are therefore now drilled at 27 inches. This method leaves ample room for hand- and horse-hoeing, which is vigorously prosecuted among them throughout the spring. In the third week in May, and just previous to the final horse-hoeing, a seed-barrow, cleverly prepared for the purpose, is run over the land and drops *in the centre of each wide row* the very small quantity of half a pound per acre of white turnip-seed. The difficulty, of course, is to get this very scanty seeding evenly distributed; but Mr. Lane's ingenuity is equal to this contrivance, and the result is so thinly scattered a plant that no hoeing or chopping out in any way is required. The horse-hoe follows and completes the operation, at one stroke giving a final touch to the bean-crop, and covering at the same time the turnip-seed.

At the time of harvest it might be thought that the machine could not be safely employed; but, on the contrary, Mr. Lane finds that he can, without material injury to the turnip-crop (which is by that time making considerable progress), use that invaluable implement, and thus no extra cost is incurred in consequence of the extra crop. The reaper cuts the beans entirely the same way as the drills run, the turning being accomplished upon the headlands, and the driving wheels running upon the stubble and being kept clear of the young turnips.

It was certainly a novel experience to the Judges to find among the bean-straw, in the stack sides, large turnip-leaves which had been cut by the reaping-machine at the time of harvest; but a careful examination of the roots themselves satisfied them that little, if any, damage had occurred to them from its use, and that a valuable and nutritious crop of turnips had by this admirable plan been added to the resources of the farm, at a minimum cost.

As soon as the bean-crop is harvested, the broadshare is run between the rows of turnips, in order to cut the stubble and destroy any weeds which may remain. The operation is now complete, and by November the "extra crop" is under consumption by sheep.

We were somewhat curious in our examination of these bean-turnips (as Mr. Lane has christened them) at our November visit. We found a fine lot of lambs upon them, eating ⅓ lb. of rape-cake and ½ pint of maize a day. The crop last year was a very good one. Some of the seed had fallen singly, and in that case the turnips were a good size; others again had fallen in groups of two, three, four, and five; but from the ample room on all sides of the plants, owing to the width of the rows and the comparative regularity of distribution, even these "bunched" turnips had thrown themselves outwards and produced very fair-sized roots.

Now, if it be objected to that the bean-crop must be partially sacrificed to the "extra crop" by this treatment, owing to the width of the rows, Mr. Lane's answer would be, that in 1875, with the wide rows 31 inches apart, he threshed an average of 36 bushels per acre of beans, which produced 10*l.* 10*s.*, and that this was certainly under, rather than over, the general result.

On the pea portion of the break the same system of extra cropping is adopted, but a different course is pursued. About four or five acres are generally drilled 14 inches apart, and at the rate of 3 bushels an acre, some early variety being selected (such as Sangster's No. 1) which may be suitable for pulling green for the market. Between every third row and at a distance of 42 inches apart every way, drumhead cabbages are planted about the beginning of May. The peas are sold to pick for the Birmingham market, and last year the satisfactory price of 10*l.* 10*s.* per acre was realised, the haulm being left and the purchaser paying all expense of labour in picking. It will readily be understood with what facility the subsequent cultivation of the cabbage-crop is attended. The horse-hoe is enabled to work without hindrance between the rows in each direction, and very little hand-labour is therefore required. The cabbage-crop at our November visit was capital. It was already stocked with the ewes, who were eating half a pound of rape-cake and half a pint of Indian corn, and were thus adding to the fertility of the land.

Only part of this break (as I have mentioned) is thus treated. The remainder is planted with peas for a crop; but it must not be supposed that where they are thus allowed to remain, Mr. Lane is content without his extra crop. In this case, immediately they are harvested, rape, mustard, or turnips are quickly put in, whichever may be most required according to the circumstances of the young sheep-stock.

Wheat follows each and all of these extra crops, and completes the rotation. The time of sowing of this part of the wheat-break necessarily varies somewhat. Mr. Lane says: "I commence as soon in November as I can, and never plant after December if I can help it. I dislike spring-wheat, and if I have a portion of bean-turnips eaten off late, I prefer oats, which come off early, and I can get a brush crop of turnips again by the aid of the water-drill, after which the regular fallow mangold-crop comes in order." The only thing necessary to remark in the case of either the wheat or the oats following these extra crops, is the small quantity of seed used, which in the case of wheat is from 5 to 6 pecks, and in that of oats 2 bushels per acre. If any portion of the wheat seems in the spring to require a stimulant, it is top-dressed with 1 cwt. of nitrate of soda and 1 cwt. of bone-manure.

Such is a brief *résumé* of the ordinary farm-practice upon

Broom Court. It will be admitted that it is exceptional in many particulars, and it suggests several important considerations to practical men. The first will probably be, at what expense is this system carried out? Catch-crops are by no means novelties in modern agriculture, but it is often found that they cost more than they are worth, and in many cases they have been tried and abandoned by excellent farmers. Neither is it desirable that a market-garden system of cultivation, with its attendant expenses, should be placed in comparison with ordinary methods of agriculture; and although it is self-evident that such additions to the root-crops of the farm will enable a much greater head of stock to be maintained, we must ascertain something more of the cost of the operation before we form an opinion of its ultimate benefits.

The best answer to such an inquirer is at once to produce Mr. Lane's labour-bills, which will, we think, serve to dissipate any illusions that his system is carried out at any excessive cost.

In the four years 1871–5, Michaelmas to Michaelmas, the cost of labour, including coals, threshing-bills and beer, was as follows:—

	£	s.	*d.*
1871–2	533	13	1
1872–3	530	14	11
1873–4	657	3	8
1874–5	597	1	9
4)	2318	13	5
	579	13	4

The labour for the past four years has, therefore, averaged 1*l.* 10*s.* 6*d.* per acre on the whole farm. As, however, the proportion of grass land is somewhat large, it may be well to adopt the same plan as in Mr. Stilgoe's case, and assuming the cost as 10*s.* upon the pasture, thereby roughly reckon the amount spent on the arable land. By following this plan it will be found that the cost per acre is 2*l.* 8*s.* 6*d.** I think it will generally be admitted that this is by no means an excessive amount for a farm characterised by such management.

A glance at the cropping list will show us what it is that Mr. Lane actually effects by his system. On 200 acres of arable land the following crops have been grown during the last and the present years:—

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* I do not wish here to go into the question whether 10*s.* is a fair sum, hypothetically, to place upon the grass-land labour. It is a large subject, and one which need not be discussed in this Report. For the sake of convenience I have assumed that sum as a reasonable one, and I have applied it equally to all the competitors.

	1875.		**1876.**	
	A.	R.	A.	R.
Vetches	4	0	3	2
Wheat	78	0	62	2
Peas harvested	5	0	4	1
Peas pulled	4	2	4	2
Beans	35	0	34	0
Barley	22	0	24	0
Oats	..		10	0
Mangold	24	0	18	3
Fallow swedes	..		8	0
Seeds mown (Second time 16 acres)	18	0	18	0
Seeds grazed	5	0	9	0
Potatoes	0	2		
Fallow borders	0	2		
Total	196	2	196	2

EXTRA CROPS.

Bean-turnips	25	0	28	0
Vetch-turnips	4	0	4	0
Clover-swedes	5	0	5	0
Pea-rape	5	0	9	0
Pea-cabbage	5	0		
Bean-rape	..		6	0
Oat-turnips	..		10	0
Total	240	2	258	2

There was then, last year, a total of 68 acres of roots and rape. This year there will probably be no less than 81 acres (including stubble-turnips). I say "probably," because, of course, the oat-turnips and the bean-rape were not in at our July visit. Mr. Lane informs me that about 70 to 80 acres is his maximum of roots; but reckoning stubble-turnips, the quantity is sometimes increased to 90 acres.

I do not think that any words of mine will add to the interest these figures ought to excite. The fact that on 200 acres of land, 60 to 80 acres of roots can be regularly taken, without interfering with the corn-cropping of the farm, is one well worthy of attention; and although few farmers, perhaps, may have land so thoroughly adapted for the purpose as this farm, I cannot doubt that with such management as is here exhibited, similar results might be obtained in many districts in England.

I have Mr. Lane's permission to publish the yield and price per acre of his various crops in 1875, and a glance at these will convince my readers that if the farming is exceptional, so also must be the land which in the face of such a miserable summer could produce such an uniformly respectable result:—

	Yield	Price per Acre.
	Bushels.	£ s. d.
Wheat	35	10 10 0
Beans	36½	10 10 0
Peas	36	11 8 0
Barley	52	12 7 0

The Horse Work of the farm is performed in a very superior manner. Eight cart-horses are kept. They are useful, but neither remarkable nor showy animals, and the whole team-work devolves upon them, steam-power not being used. I have mentioned that only one ploughing is given for any crop, except under very extraordinary circumstances. The corn-drilling, the horse-hoeing, and the ploughing are all splendidly executed; the extreme precision of the drilling in particular could hardly be excelled, and this much facilitates the work of the horse-hoe, which is certainly no less admirable. In the drill-work not a handshake from one end of the field to the other is visible, and the horse-hoe when at work on peas or other crops cuts to the very edge of the rows, and performs the operation in a manner which could not be surpassed, if indeed it could be equalled. by the most careful manual labour. For mangolds and turnips Mr. Lane prefers a swing horse-hoe on a pair of light high wheels, which is made by Kitchen, of Stratford-on-Avon. It has a light pair of shafts, and, in addition to the shares for roots, has a set for corn. It is used also among the wheat and barley, is easy to guide close to the rows, and can be put thoroughly into the soil so as to gain a good tilth. The same hoe is used for the winter-beans the first time, doing a wide row once and two of the narrow rows twice at each turn; but afterwards Carson and Toone's hoe is used, as it has no wheels, and therefore does not injure the crop when the beans have got to some size.

Single-furrow ploughs are entirely used (Hornsby's or Howard's being preferred), because with them alone can the skimmer be properly employed, and Mr. Lane is very careful on this point. To use his own words, "Only by this means and by diligent forking can the land be kept clean when it is always in crop, and it is so necessary to put below the surface any seedling couch or other weeds introduced by meadow-hay." Three horses, at length, are always used in ploughing according to the almost universal custom of the county.

The whole of the corn is cut by machines, and what with this and the extra crops the horses do not enjoy any sinecure, as may be imagined. Their winter-keep consists of half a bushel of old beans and half a bushel of Indian corn, with good clover between feeds, and bean or pea cavings and riddlings for supper. In the early part of the summer they live on the vetches which are cut in the order named in describing that crop. When these are finished, they are turned out on the lattermath clover, and still later down in the dairy-ground (near the house) to commence again with their corn-feeds. The work is very stiff after harvest to get the winter-bean land manured and ploughed, and the clover-leys broken up for wheat.

Cattle.—In November we found 66 head of cattle on the farm; in May, 78, and in July, 66. They were thus divided:—

	November, 1875.	May, 1876.	July, 1876.
Dairy cows	13	12	12
Feeding cattle	15	24	20
In-calf heifers (Stirks)	5	11	11
Young grazers	21	18	10
Calves	11	12	12
Bull	1	1	1
Total	66	78	66

The stock, which is entirely of the Shorthorn breed, is very good. The cows are of a capital roomy type, with large frames and good flesh. For the most part Mr. Lane rears, feeds, and finishes all the cattle bred upon the farm; but occasionally a lot of two or two-and-a-half year old grazing cattle are sold off to finish elsewhere. A bull of pure Shorthorn blood is always in use. At the present time a young bull of Bates' blood, which was selected at the last Birmingham Show, is in service. Mr. Lane keeps rather a large dairy, it will be noticed, but does not sacrifice to that object the fleshy and feeding quality of his cattle, which are most of them of pure blood of various strains. The grazing land is more adapted for feeding draft cows than bullocks, and these are generally bought in for the purpose of fattening in the autumn or winter, and kept in the yards, where they get barley-straw and mangolds. The in-calves are kept in the same way, and any showing want of condition get 3 lbs. or 4 lbs. of linseed-cake, and a little flour from offals, and some of the worst of the hay till near calving, when they get the best hay and mangolds. Mr. Lane has a great idea of feeding the cake principally upon the land with sheep, and in other respects to make the farm "baste" itself, and therefore the keep of the cattle in the yards is not very high. The two-year-olds get about 4 lbs. of Rubsen rape-cake a day, with barley-straw and mangolds, and the other young stock a small quantity of cake and hay. The home-bred heifers are kept, and for the most part drafted into the herd. In the meadow near the river, called "Beef Leasow"—a good old Saxon name which still lingers on in the Midlands—we found 24 capital draft cows at our May inspection, in forward condition, and looking like paying money. The young stock was also generally good and fresh, especially 8 two-and-a-half year old steers, which Mr. Lane shortly afterwards disposed of. The upland pastures being somewhat liable to burn in a dry season, and the meadow-side ones to flood in a wet one, makes it rather difficult to stock the farm with cattle to advantage; and thus the head of stock has occasionally to be regulated in a rather different manner to that which Mr. Lane would desire.

Sheep.—The sheep are entirely of the Oxford Down breed. The stock of sheep on the farm at each of the three inspections was:—

	November, 1875.	May, 1876.	July, 1876.
Feeding sheep (Barren ewes)	37	12	30
Breeding ewes	152	136	100
Lambs	217	163	160
Tegs (Theaves for flocks)	..	252	51
Rams	3	3	3
Total	409	566	344

In looking at the July figures, it must be borne in mind that, except in a wet season, the sheep stock is reduced during the summer months to a minimum, as the breeding stock require all the land except that which is devoted to the feeding cattle. In autumn, with favourable prospects for the extra crops, the head of stock again increases, and occasionally from 600 to 700 sheep are on winter keep on the farm.

All sheep bred on the farm, except those intended for addition to the flock, are sold off fat as clipped tegs in the spring months. The ewes are a capital lot, large framed sheep with plenty of quality, and evidence very careful selection. The rams for stock are bought in—Oxford Down sheep with the greatest frames, the most colour, and the best wool, being invariably selected; 152 ewes are annually put to the ram, 52 theaves being added each year, and the surplus culled. Each ram takes 50 ewes, or thereabouts, the latter receiving a mark according to the sheep with which they are assorted. The ewe-lambs intended for the flock are selected early in the autumn, and receive slightly different treatment from the remainder of the lambs which are intended for early mutton. These latter are carefully kept improving all through the winter, receiving at first about ¼ lb. of rape-cake with turnips or rape, and a little clover, and towards the spring getting cut mangolds, clover, and about ½ lb. of linseed-cake.

It will be sufficient evidence of the careful feeding of these sheep, if I mention that in May of the present year 100 were sold at Stratford, which averaged 73*s.* each out of the wool, and clipped 8 lbs. of wool apiece. It is needless to say that such results as these are not attained without high feeding; still Mr. Lane's system did not strike us as at all extravagant, and indeed the cake-bills alluded to further on will prove the economy with which it is carried out. The management of the sheep-stock all through seemed to the Judges admirable, and received their almost unqualified commendation. I should add that 160 fat sheep had been sold off the farm between November and May, it being Mr. Lane's custom to buy and sell fat, according to his keep.

Swine.—Three breeding sows are kept, of a moderate size and good feeding qualities, to consume (with their produce) the milk, offals, &c. The young are sold as soon as they will fetch 30*s.* a head, and the sows after the first farrow are fed for the house.

I will now briefly allude to our three inspections of this farm. From the character of the land it was hardly to be expected that the flood of November, during which our visit was made, would cause so much inconvenience to Mr. Lane as to some of the other competitors, and we found its principal ill-effect confined to the meadows, which were deeply covered with water, and from which, therefore, all the stock had been removed. No wheat or winter-beans had been sown; but the land was in a forward state of preparation, and postponement of seeding was preferred to planting the corn in an unsatisfactory condition. The he-tegs were on bean-turnips, eating one-third of a pound of cake and half a pint of Indian corn. The ewes on the cabbage looked well and blooming, the ewe-tegs for flock were on rape after vetches, and were getting ¼ lb. rape-cake and clover-hay. The swedes after seeds were very good. They were sown as late as the 20th of June, either 2 cwt. of Webb's bone-manure, or 1 cwt. of nitrate of soda, and 1 cwt. of "Penguin" guano having been used with them. The cabbages after peas (pulled for market), 3½ feet apart every way, were large and formed a very substantial addition to the food of the farm. The ewes on them got ½ lb. of rape-cake and ½ pint of Indian corn. The mangold crop was not yet harvested, but a portion of the Long Red had been tested for Messrs. Webb's prize, with the result I have mentioned before of nearly 50 tons per acre.

In May 163 lambs were alive from 152 ewes put to the ram. Twelve of the theaves had proved barren, and 4 ewes had died during the winter or in lambing. Tegs were being clipped weekly for the Stratford Market. They were now on mangolds, and their extra food has been previously mentioned. Some clipped tegs bought in since our previous inspection were also being marketed, and were leaving their wool and 4*s.* or 5*s.* a head for about two months' keep. The horned stock generally was in good condition, and the dairy cows especially taking. The crops were generally looking fairly, though some of them were a little weedy. The wheat had all been harrowed, but little of it hoed. Beans and peas were being hand- and horse-hoed, and were looking well. The barley (some of which had only been sown a fortnight) was only just peeping, and the mangold just showing from the ground. On a 20-acre piece of wheat, part of which had been sown after beans and peas, and part after bean-turnips, we had an opportunity of comparing the two crops, and it must be confessed that, so far as appearances then went, it was in favour of the former. The wheat had much of it a somewhat yellow cast, and from the small quantity of seed used did not make so much show as most of that in the neighbourhood.

In July the farm was unmistakably suffering from drought, which had somewhat severely affected this part of Warwickshire, and was of course peculiarly felt on this description of land. The wheat, however, had grown into a grand crop with little exception. A large proportion of "Scotch Square Head," which I believe to be the same as "Scholey's Square Head," described in Mr. Morton's Report in this 'Journal' (vol. x., N.S., p. 102, 1874), had been sown, and was especially promising. An 18-acre piece (Orchard Close) might probably fairly be estimated at 48 bushels an acre. Peas had been pulled for the Birmingham Market, and had realised 12*l.* per acre, the purchaser paying all cost of gathering, and leaving the whole of the haulm and many small peas. This land had already been cultivated, and was awaiting a shower for mustard and rape to be drilled upon it. The bean-turnips were sadly in want of rain, and although there appeared to be a fair plant, it was too soon to say at present whether there would be a crop of them. The swedes after clover were, however, set out, and only wanted a shower to ensure their safety. Green Globe turnips were just coming up after vetches; and swedes after rye, though a good plant, called unmistakably for rain. The fallow swedes were somewhat backward; but the mangolds were all good and forward. The beans were well podded and free from fly; and the peas for a crop were just fit to cut and very promising. The drought had affected the barley and oats very considerably, and some of the former (after mangolds) put in late was prematurely ripening before it was well in ear. The hay and clover were in stack, and a large rick of the latter had evidently been somewhat hastily put together, the symptoms of "undue warmth" being very marked. It is only fair to say that Mr. Lane had this season adopted an American unloading fork, and was, perhaps, hardly prepared for the amount of work which that implement will accomplish; hence, possibly, this result. The clover lattermaths were much burned up with the recent heat. The stock were in good condition. The lambs, now numbering 160, were on grass, and getting a mixture of oats, maize, and bran mixed. The theaves for the flock excited our special admiration, as they did in May. Eleven heifers in-calf were running in "the Park" with the breeding cows, and, together with the rest of the yearling heifers and steers, made a very pretty lot of cattle. The horses were in the enjoyment of a temporary rest previous to the commencement of harvest, which would begin in a few days.

It was plain that this was not a very favourable season for the inspection of a farm worked on the "extra crop" system, and that the continued drought and heat had somewhat seriously affected some of its prospects. There is a Kentish saying relative to the Isle of Thanet—"When England wrings, the island sings;" and with equal truth it could probably be said of Broom Court Farm, that the rains of the last season, which on many lands caused such ruin and desolation, were on this description only harbingers of prosperity. That they caused no loss is proved, I think, by the almost uniform character of the crops in 1875, as given above. It is to be feared that the present season will hardly prove so satisfactory.

The expenditure on cake, corn, and artificial manure is very moderate. For the last four years it has been as follows:—

	Cake and Artificial.	Corn, Bran, Grinding, &c.
	£ s. d.	£ s. d.
Sept. 29, 1871–2	125 11 0	106 5 9
,, 1872–3	138 0 0	108 3 8
,, 1873–4	228 16 10	126 12 4
,, 1874–5	221 12 2	83 19 8

The average of cake and artificial manure has thus been 178*l.* 10*s.*, of which the manure has cost about 80*l.*, and that of corn, whether grown on the farm or purchased otherwise, 106*l.* 5*s.* 4*d.* The total is therefore 284*l.* 15*s.* 4*d.*

The usual labour employed on the farm is that of 10 men, 4 women, and 4 boys. There are four neat and most comfortable cottages, for which rent is paid by Mr. Lane, and which are relet by him to his men at 1*s.* 6*d.* per week. Every cottage has its own cistern and back offices, and contains five rooms, of which three are bedrooms. There is also a good-sized and productive garden attached to each. The shepherd and the two cattlemen occupy three of these, and a waggoner the other. The wages paid are:—

1 shepherd, 17*s.*
2 cowmen, 17*s.* each.
1 waggoner, 17*s.*
1 under ditto, 12*s.*
3 labourers, 15*s.* each.
3 Irishmen, 15*s.* each in summer only.

The Irishmen have come regularly to Mr. Lane for 20 years. Boys get 5*s.*, 6*s.*, and 7*s.* Women get ordinarily 10*d.* per diem, but in hay-time 1*s.*, and 7*s.* 6*d.* instead of an allowance of beer. Men get 1*l.* for beer in hay-time, and boys 5*s.* each. Harvest is put out to get in stack at about 15*s.* per acre sometimes; at others the corn is put out to bind—6*s.* 6*d.* is the price given in this case; but able-bodied men get 30*s.* a week *certain* for the harvest-month, and boys about double their ordinary wages. The hours of work for men are from 6 to 5.30 in summer, and for women from 8 to 5.

Gates, Fences, and Roads.—The gates are good. The farm road running almost through the centre of the arable land (as before mentioned) is an excellent one. In addition to this, there is the drive up to the house, through the pretty pasture called the Park, which is well kept. The hedges are principally of whitethorn, and are trimmed and kept in sufficiently good order. The general rule is to trim them after haymaking and again at Michaelmas. They are also forked and cleaned regularly as required previous to the cropping of the land. The fields are for the most part large and convenient for cultivation, and there is very little waste of any description on the farm. The yards and farm premises are remarkably tidy, and the general aspect of the farm neat and well-ordered.

Book-Keeping.—Capital books are kept. 'Taylor's Farm and Labour Account-Book,' which is of a very simple character, is used. It shows in a handy form the principal items of the accounts. Mr. Lane was kind enough to furnish us with very ample particulars for the last four years, and to give us every information which we desired. We were, therefore, left in no doubt of the profitable character of his management, of which, however, after an inspection of his farm, there could be little question.

From the accounts we learned that the average value (for the last four years) of meat and wool produced on the farm has been *3l. 3s.* an acre, reckoned on the whole area of the farm. It must be borne in mind, in considering these figures, that Mr. Lane's is very high rented land, and that his object is, therefore, to "make the farm support itself" as much as possible. His outlay in cakes and feeding-stuffs is therefore an extremely moderate one. A comparison must not be drawn between land on which a very large outlay in stock-food is absolutely required to make it productive, and this, in which such extra outlay may be said to go in the shape of rent. Here is land which is let at a price which would be looked upon as excessive in some parts of England, because, to use a common phrase, "it will grow anything." Swedes, mangolds, wheat, barley, beans, peas, nothing comes amiss to it; and although it undoubtedly requires good farming, such an outlay as in Norfolk would be profitable, would here be ruinous. The figures, therefore, must be considered in connection with the cake bills; and when it is remembered that hay and clover are often sold in sufficient quantity to pay the whole of these, it must, I think, be admitted, that in the most important matter of the present day, viz., the production of meat, Mr. Lane takes a very satisfactory position.

In concluding the Report on this farm, I cannot help mentioning the great help which Mr. Lane receives from his two sons, Mr. Arthur Lane and Mr. Douglas Lane, who are at present his assistants in the business. The most important operations of the farm had been most skilfully directed, and in some cases performed by them, and it was a pleasure to the Judges to receive the intelligent explanations, which they were always ready to offer, of each particular of the farm practice. Mr. Lane's is no ordinary farm, and careless indeed must be the man who does not carry away some useful lessons and some thoughtful reflections from its survey. Although in point of cleanliness it hardly reached the high standard attained by Mr. Stilgoe, or the still greater perfection of Mr. Adkins' occupation, and is therefore less fitted to undergo the prying researches which it was our duty to carry out; and although in some other matters it fell, in our opinion, somewhat below the First Prize Farm in merit, in all the essentials of profitable farming it must be admitted to a very high rank. Without interfering with a course which has been proved in this locality to produce the best results as far as corn-crops are concerned, Mr. Lane manages to put about two-fifths of his land annually under root-culture, and this, by a process, which is not only ingenious, but which is skilfully carried out, and which must add in a material degree to the meat-producing capacity of the farm. It was with much pleasure that we awarded the Second Prize of 50*l.* to Mr. Lane, and I shall have failed in my intention if I have not conveyed to my readers some idea of an admirable farm with much that is interesting, and even striking, about it, and which is under a spirited, original, and thoroughly practical and business-like management.

MR. J. C. ADKINS' FARM.

Special Prize of 25l. for Cleanliness of Crops, excellent Management of Fences, Roads, and Gates, and general Neatness.

Milcote Farm is about 2 miles south of Stratford, and a short distance from the road leading from that town in the direction of Chipping Campden. About a mile south of Stratford the Avon becomes the boundary of the county separating it from Gloucestershire, but a small spur of Warwickshire is just here projected across the river, and is almost entirely occupied by the Milcote Farm. It consists of 278 acres of arable land and 95 acres of pasture, but a small quantity of land adjoining the town of Stratford (and held under another owner) is farmed in conjunction with this occupation, and the total area is, therefore, 393 acres, of which 288 are arable and 105 pasture. It should also be mentioned that Mr. Adkins occupies about 30 acres of grass land (his own property) at Mickleton, about 3½ miles' distance from Milcote, but in another county.

The house is at the north-eastern corner of the farm, in rather a low situation, close to the small river Stour, a tributary of the Avon, which, up to its junction with that river forms the north-eastern boundary of the farm, after which the Avon becomes its limit on that side, whilst the road between the villages of Clifford Chambers and Welford skirts its southern confines. Its bounds are, therefore, very distinctly marked. The whole of the lower portions in the neighbourhood of the Stour and the Avon are occupied by the meadow lands, and the arable part of the farm lies on a very gentle slope rising from the valley to the south. The Stratford and Honeybourne branch of the Great Western Railway, which here closely hugs the Avon valley, runs through the farm, dividing for some distance the meadow from the arable land, and intersecting the latter at one corner in its course. The Milcote Station of this line is a short distance beyond the north-western extremity of the farm, and about a mile and a quarter from the house.

The farm is extremely compact and well laid out (see Fig. 3, p. 531), the whole of the arable land being contiguous, and only two grass fields, which lie in the highest part, being separated from the remainder of the pasture. With this slight exception, the whole of the upper lands are under the plough. The fields are large, the fences straight, and the appearance of the farm is exceedingly taking.

The soil is for the most part a very fertile productive loam of a reddish-brown colour, with plenty of consistency, and mixed with stones, generally of a smooth character. A little of the upper part of the farm is upon the Lias formation, the junction of which with the Sandstone occurs here; but as the Lias clay is overlain with gravelly drift, the soil does not differ in this part so materially from the remainder of the farm as to require any special treatment.

A beautifully kept farm-road extends the entire length of the occupation, dividing it into two pretty equal portions, and adding very much to its facilities for cultivation. There are two sets of buildings, one near the residence, the other at the opposite end of the farm, and adjoining the road just mentioned. The buildings are sufficient, but of an ordinary character, and the house is a comfortable and pleasant residence, suitable for the occupation.

The farm has been in the occupation of Mr. Adkins' family during the whole of the present century, and the name of Mr. John C. Adkins, of Milcote (the father of the present tenant), who died in 1871, will be widely remembered in connection with his famous herd of Shorthorns. The memory of this estimable man, however, still lingers on in other quarters than "Shorthorn" society, and in our intercourse with Warwickshire men many were the lips which bore testimony to his kindness and his worth as a man, no less than to the splendid character of his management as a farmer. In this latter respect he was, perhaps, almost unrivalled in his county, whilst as a Shorthorn breeder the memory of his "Charmers" and his "Sweethearts" is too fresh to render it anything but presumption on my part to eulogise his herd.*

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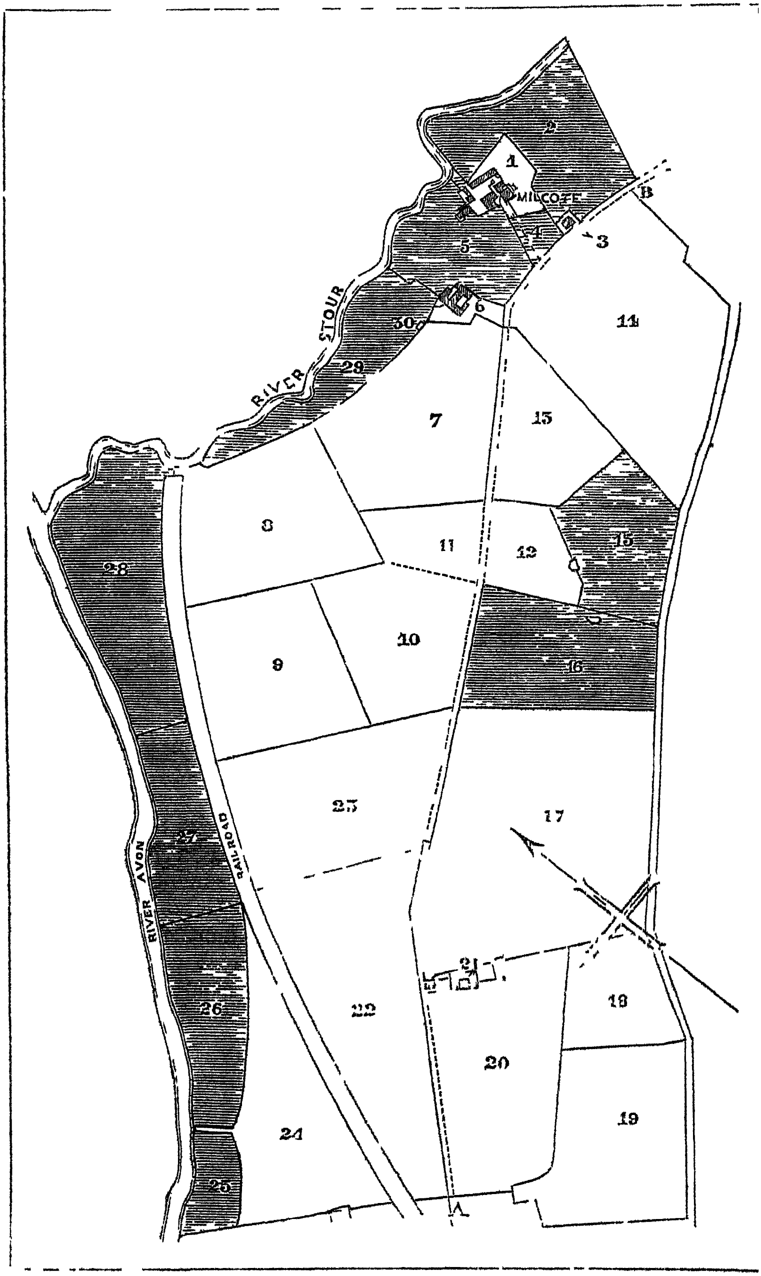
* In 1843 Mr. Adkins (who had for many years before that been a breeder of pure Shorthorns of Colling's blood) got the strain which made his herd so famous. In that year, at the sale of the Right Hon. Charles Arbuthnot's cattle at Woodford, he bought "Charmer," a granddaughter of "Sylph," and in 1847 bred "Sweetheart" from her by "Accordion." The celebrated bull, "Earl of Dublin," was bought from Mr. Stephenson. In 1854 Mr. Strafford sold the herd, which had accumulated to too great proportions for the farm, but this blood was retained. At this sale 36 cows and heifers and 10 bulls made about 30 guineas a-piece. On March 28th, 1860, Mr. Strafford again officiated with 51 head of cattle. On this

REFERENCE TO PLAN OF MILCOTE FARM.

No.		Cultivated Land. A.	R.	P.	Fences, &c. A.	R.	P.
1	House, Garden, Buildings, &c.	3	0	27			
2	Swing House Close	13	0	30	0	1	16
3	Cottages and Gardens	0	0	25			
4	Close in front of house	1	1	22			
5	Dovehouse Close	7	1	35			
6	Farm Buildings, Yard, &c.	1	2	14			
7	Nine Rick Park	19	3	27	0	1	38
8	Walk Mere Hill	18	3	28	0	2	18
9	Stall Ground	16	0	36	0	0	22
10	Hill Ground	14	1	39	0	0	16
11	Part of Hill Ground	6	0	38	0	0	14
12	Hanging Park	4	3	31	0	0	30
13	Marlpit Park	9	3	9	0	0	37
14	The Park	31	1	16	0	1	26
15	First Thistle Ground	10	3	25	0	1	26
16	Second Thistle Ground	13	1	12	0	1	15
17	Third Thistle Ground	42	1	14	0	1	37
18	The Nap	7	2	11	0	0	38
19	Hanging Horse Hill	17	2	22	0	1	27
20	Burnt House Ground	20	2	35	0	0	22
21	Cottages, Gardens, Buildings, &c.	1	0	0			
22	Barn Ground	28	2	32	0	0	7
23	Oak Tree Ground	21	2	13	0	1	1
24	Lower Ground	18	0	17	0	1	15
25	The Fence	3	3	7	0	0	9
26	Lower Meadow	10	2	23			
27	Middle Meadow	10	0	27	0	0	22
28	Stony Ford Meadow	18	2	21	0	0	8
29	Park Meadow	9	0	24	0	0	36
30	Garden	0	0	11			
31	Road from A to B		..		3	2	18
	Totals	383	0	31	9	1	18

Fig. 3.—*Plan of Milcote Farm, in the Occupation of Mr. J. C. Adkins.*



The grass land is shaded, and the arable land left plain.

The Milcote Farm is held, under a yearly tenancy, of the Hon. Mortimer Sackville West, of Knole, Sevenoaks, and there is no restriction as to cropping or to selling hay or straw. Mr. Adkins, however, never avails himself of the latter privilege, nor does he deviate from the common six-course system of the county under any circumstances. That course, as I have had occasion to mention before in connection with the first two Prize-farms, is (1) Roots; (2) Barley; (3) Seeds; (4) Wheat; (5) Beans or Peas; (6) Wheat. On the occasion of a change of tenancy on this estate there is a very singular custom as regards the root-crop, and one which must be very prejudicial to the interests of at least the outgoing tenant. The mangolds or swedes are not valued, but the incomer only pays for seed and acts of husbandry. The cultivation of these crops is carried out with such similarity to that which I have described on the other prize-farms, that it would be tedious and unprofitable to enter into minute details. I shall, therefore, content myself with a few notes on the general features of the management.

Absolute cleanliness having been for many years one of the principal characteristics of this farm, the wheat-stubbles require very little attention previous to the root-crop. They are, nevertheless, of course, carefully looked over, and manured with about 15 loads of well-made dung per acre. They are only once ploughed. Of the 40 or 45 acres which come in for roots, about 30 are allotted to mangolds, for which the land is splendidly adapted. These are sown, if possible, as early as the last week in March, at a distance of about 27 inches on the flat, no artificial manure being used. The Yellow Globe is the usual variety, and the quality of the roots generally is very fine. They are put out in the spring to men to set out, single, and finally clean at 12*s.* an acre; and about 13*s.* is paid in November for taking up, topping, and heaping. Swede sowing commences immediately the mangolds are got in, the land having been treated in a precisely similar manner. About 4 acres of the root land is annually cropped with cabbages, which grow an immense bulk of very valuable keep. These are planted early in March, the land having been carefully marked out previously

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occasion no less than 31 were pure "Charmers," and these averaged 69*l.* a-head. 8 of the "Frill" family made 56*l.* a-piece. The average of the whole of the cows and heifers was 66*l.* 17*s.* 2*d.* (a very large sum in those days), and that of the entire herd 61*l.* 18*s.* 2*d.*

In 1868 (March 25) a third sale of 47 head took place, when Mr. Strafford stated that his instructions were to sell all the herd with the exception of one cow for the dairy. Many of the animals were again of Sylph blood. The average of the cows and heifers this time was 85*l.* 11*s.* 6*d.*, and 15 bulls averaged 52*l.* 10*s.* a-piece. These figures are, I think, interesting as showing the rise in the value of these families. It would be still more interesting to know what they would fetch at the present time.

with a drill, with the coulters set at 3 feet, and the first mark being crossed at right angles by the same process. The cabbages are planted exactly at the intersection of the coulter-marks, and can therefore be horse-hoed in four different directions. As a matter of fact, however, two turns with the hoe are generally found sufficient, taking the course of the drill, and the remainder of the cleaning is very easily accomplished by hand. They are fit to stock about Michaelmas. A few white turnips for early feed are also sown in this break as soon as the first week in May. Their cultivation does not differ from that of the swedes and mangolds. The swede-crop of 1875 was very fine, the roots being large and of good quality. The mangolds and cabbage were also capital crops. About one-third of the mangolds and swedes are carted off the land, and the remainder consumed by sheep upon it.

Barley is sown as early as the land will work. Three bushels is the usual seeding, and the sort favoured is Hallett's Pedigree. The mixture of seeds in laying down the land with clover is 8 lbs. broad, 4 lbs. White Dutch, 4 lbs. trefoil, and 1 peck of rye-grass. This very liberal seeding is apparently well paid for. Nowhere did we see more luxuriant seeds, or a more perfect plant, than on Mr. Adkins' farm at our May visit. About half the acreage of seeds is grazed, and half kept for clover-hay, and the steam-plough is occasionally called into requisition to break up the grazed seed-land for wheat. About 21 acres had been thus steam-ploughed at our November visit, and the work was well executed at a depth of about 7 inches.

Browick Red Wheat is sown, the quantity of seed used being 2½ bushels an acre. The wheat is always harrowed in spring, and generally also hoed at a cost of 4*s*. an acre. It is cut by a Hornsby's "Governor" machine nearly always, but, when this is impracticable, it costs 18*s*. to 20*s*. an acre to reap it by hand. The stubbles are again looked over, and the land manured for beans and peas at the rate of 12 or 14 loads per acre. The peas are planted early in February, and 3 bushels of seed is the quantity drilled. A piece of 32 acres sown with "Nimble Tailors" this year excited our special admiration, being not only the forwardest, but also the most perfect, plant which it was possible to look over. These were hoed at a cost of 4*s*. per acre. Winter beans are the favourite variety; they are sown at the rate of 4 bushels an acre, and hoed as often as required at a cost of 4*s*. per acre each time. Wheat again follows, and completes the rotation.

In describing this commonplace routine I am aware that I fail in giving any accurate impression of this remarkable farm. Before proceeding, therefore, to describe the stock, let me enter into some detail as to its most characteristic features, viz., its exceeding cleanliness, and the beautiful character of its fences and roads. In these particulars Mr. Adkins is *princeps* (I might almost say *facile princeps*) among the very clean and excellent farmers who entered into the competition. In walking over a pea-stubble of nearly 30 acres, ploughed for wheat at our November visit, we essayed the difficult task of finding a piece of couch. Spreading ourselves out we marched across the field, and it was not until we had arrived at its extremity, and were about to quit it, that one small sprig was discovered, and unearthed, to the unutterable dismay of the farm-bailiff who accompanied us. This had, doubtless, found its way from the neighbouring hedge-row close to; but the audacity of the plant taking root at all in such hallowed precincts seemed quite to upset the equanimity of our companion, who made several allusions later on to "that bit of squitch" which "he could not get over."* At the same visit, with our eyes well open, we only discovered three thistles on the entire farm. Such admirable cleanliness as this deserves a record. It is told of the late Mr. J. C. Adkins that, riding over a field of peas in early spring, he discovered a dock, whereupon, without marking the spot, he despatched a labourer to search for the intruder. After three or four days of diligent quest it was detected and borne home in triumph, where, no doubt, it still remains among the family curiosities. The story is good enough to be true, and, indeed, may very readily be believed when the present condition of the farm has been examined. The same gentleman had also a theory about the eradication of thistles, which has always been carefully acted upon at Milcote with the results above mentioned. Cast-iron shares are never allowed on the ploughs, but wrought ones substituted. It seems highly probable that the blunt cast-iron shares, so commonly used, may have a tendency to push a tough root like a thistle on one side instead of cutting it. But, however that may be, Mr. Adkins' theory and his practice went hand in hand, and the result is an entire freedom from this troublesome weed.

But cleanliness is not the only characteristic of the farm. The hedges are almost uniformly, in neatness and evenness, no less than in freedom from weeds, all that could possibly be desired. In this department also the hand of Mr. Adkins' father is visible. It was by him that these beautiful lines of quick were planted, and by him that they were nursed into their present mature growth. They are trimmed only once a year—

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* This poor fellow, whose name was David Hodges, and who had been upon the farm for twenty-seven years, shortly after our November visit left Mr. Adkins' service, and very soon afterwards died somewhat suddenly.

between Michaelmas and Christmas—and the borders are forked as often as required. Along these fences are seen at intervals upright stones, which mark two-acre plots or lands. Thus not only does the labourer know what work he is doing, but the bailiff can also keep a close watch upon the amount done. Mr. Adkins keeps a book containing a general plan of the farm, and a separate one of each field with these divisions distinctly marked.

The road, which I have before alluded to, and which traverses the occupation to the length of full three-quarters of a mile, is also a most creditable feature of the occupation, being kept in splendid repair with stones from the fields, which are, fortunately, very suitable for the purpose. The total waste of the whole farm, including roads and hedges, is only 9 acres (see p. 530).

The grass land is, for the most part, of good quality. The meadows bordering the Avon are liable to floods, and last year a large quantity of hay was floated away. They grow fine crops of grass, however, and do not require dressing with manure. The two upland grass fields are very useful pastures, and were probably originally selected for that purpose from the strength of the Lias subsoil. About 50 acres of the meadows are annually mown, and the remainder grazed with cattle and sheep. The whole of the grass land is neat, and free from weeds.

Live Stock.—The large number (for the occupation) of 12 working horses are kept. They are useful but not showy animals. The ploughing is all done by *four horses at length.* Only 3 roods a day is accomplished in this manner. In summer the horses work from 7 A.M. to 12 noon, and from 1 P.M. to 5 P.M.; in winter one yoking from 7 A.M. to 3 P.M. There is little summer-work except horse-hoeing. The winter-work is, of course, somewhat severe. Their summer-keep is lucerne, of which I should have mentioned that 4 acres is grown. In winter they get 1 bushel of maize and ½ bushel of beans. They never get hay or clover in the yards, but bean- or pea-straw is given in the racks at night. They lie out in the yards all the year round.

Cattle.—About 20 cows are annually put to the bull, and their produce reared. They are all ordinary Shorthorn cattle and have for some few years past been crossed with a polled Angus bull of Mr. M'Combie's breed. The result has been some animals which are by no means taking to the eye, and which cannot truthfully be described as encouraging to experimental breeders. Looking at the beautiful crosses which are seen in Scotland and the North of England—the blue-greys and blue-roans, which are so highly appreciated by the grazier—one is irresistibly led to the conclusion that in this case the cross is *the wrong way*, and that polled Angus or Galloway cows to a pure Shorthorn bull would have produced a more satisfactory result. It was certainly with some feeling of disappointment that, on this famous farm, so celebrated in the annals of Shorthorn breeding, we viewed this degenerated herd, and our disappointment was perhaps increased by the fact that few of the animals were good of their respective sorts.* The following is Mr. Adkins' method with his herd: 20 cows are put to the bull, and the drafts are fed on this farm or at Mickleton (the off-lying grass land mentioned previously), as the keep admits. Five cows are always kept at Stratford, from which land the milk is sold at 1*s.* per gallon; the remaining 15 are kept at Milcote, and these rear their own calves, and also some other Shorthorn heifer-calves, bought in for addition to the dairy. The cross-bred heifer-calves are also put to the bull and sold together with their produce, Mr. Adkins not being desirous of carrying the cross further. The 15 Milcote cows generally rear about 25 to 30 calves in a year. The steers are all kept for farm-stock, and are generally disposed of as stores at about the age of 2½ years; a lot of 8 had been sold, just before our May visit, at 17*l.* 12*s.* 6*d.* a head. The winter-keep of the young cattle consists of barley-straw, mangolds, and a small quantity of cotton- or linseed-cake, and the cows are kept on somewhat similar food. Not much winter-feeding is practised, and beyond the points I have mentioned there is little in the management of the stock which is noticeable. The herd in May consisted of 21 calves and 31 older cattle, of which 26 were heifers and cows, in-milk or in-calf.

Sheep.—200 ewes are put to the ram. The flock is a cross-bred one between the Cotswold and the Hampshire Downs, but they have been bred long enough here to acquire some local notoriety as "Milcote Downs." They are somewhat lighter in face than the general run of the Oxfords in this neighbourhood. Upon the whole they are very good sheep, with plenty of size, and showing also a good deal of quality. A few selected Hampshire Down ewes are annually or occasionally purchased, and these are put to a pure Cotswold tup for the purpose of breeding rams for the flock. A large head of sheep is kept upon the farm, as will be gathered from the following figures, which show the stock at our May visit:—

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* Mr Adkins related a curious circumstance to us in connection with his late father's herd Polled Angus heifers of Mr M'Combie's breed were introduced at Milcote as ordinary farm stock, after the dispersion of the main portion of the Shorthorn herd in 1868, and crossed with a Shorthorn bull. The same bull was used upon the Shorthorns, and produced calves of that breed with black muzzles. Such abnormal phenomena were observed as long since as the days of Jacob, but it is curious to find them exemplified among our most valued races of cattle in our own time.

Lambs	232
Stock ewes	176
Feeding ewe tegs	89
Stock ewe tegs	60
Feeding wether tegs	121
Ram tegs	8
Barren ewes	15
Total	701

In addition to these, which formed the regular winter-stock, 46 fat tegs had been clipped and sold previous to our inspection, and also 32 fat ewes had been sold in the wool. Considering the very large number of sheep bred and reared upon the farm, the flock presented a most healthy and satisfactory appearance. About 60 of the best ewe tegs are drafted into it every year. Lambing begins early in February and the lambs are weaned on seeds as soon as there is a meadow cleared to find room for the ewes; the weaning-time is, therefore, somewhat late. Two ozs. of linseed-cake are shortly afterwards given to the lambs, and about Michaelmas they go on the cabbages, where their keep is somewhat improved. In November, on swedes, they were getting 3 ozs. per diem of cake; shortly after this time half a pint of peas was added, and when they get on cut mangolds 2 ozs. of cotton-cake further. The highest price of these sheep out of the wool in the present spring was 75*s.*, and the average of 245, sold by auction at Stratford, was 62*s.* The amount of mutton made upon the farm is thus very considerable, without an extravagant outlay on foods, the roots being so excellent in quality.

The sum spent in cake and corn during the last four years is as follows:—

	Cakes.			Corn.
	£	*s.*	*d.*	£
1871–2..	204	10	0	233
1872–3..	130	0	0	294
1873–4..	184	0	0	263
1874–5..	172	15	0	275

The average of cake and corn has, therefore, been 439*l.* 1*s.* 3*d.* The outlay in artificial manure is next to nothing, averaging for the four years about 15*l.* per annum. The fertility of the land, therefore, may be said to depend in some degree upon the expenditure in cake and corn which I have named, and that must be considered very reasonable. The production of meat and wool upon the farm is very large, amounting to 3*l.* 15*s.* 6*d.* per acre. This capital result is in a great degree attributable to the very large flock which is maintained; and taken in connection with the foregoing figures, showing so moderate an expenditure in artificial foods, &c., it is exceedingly creditable, and places this farm in a very high class in this particular.

Labour.—Six cottages are held with the farm and occupied by labourers at the very low rent of 1*s.* a week. About six regular day labourers are employed, besides waggoner, shepherd, cowman, and three hired youths at 10*s.* a week and 2*l.* at Michaelmas. The labourers get 13*s.* a week when by the day, and 21*s.* a week at haymaking. The stockmen get 18*s.* a week the year round, and no beer. The hours of work are from seven to five, with one hour out for dinner; in haymaking from six till dark. The harvest is let to the men (a machine for cutting being found) at 16*s.* per acre, to get into stack, *without beer.* The following extras are paid to the stockmen, instead of beer: shepherd, 20*s.* for lambing; cowmen, 20*s.* for cows calving; waggoners, 20*s.* for drilling. Mr. Adkins has abolished the beer system on his farm, and wisely substituted money payments. He informs us that so enormous was this evil in days gone by, when the men had *unlimited* beer at hay and harvest, &c., that he has known two hogsheads of beer to go in one day, and one man to carry away nine gallons in the same time *for his own consumption!* In those days food was also given in haytime and in harvest to 70 or 80 reapers. The stockmen also had two or three meals a week in the house all the year round.

The present amount spent in Labour is very large:—

		£	s.	d.
Michaelmas, 1871–2	.. .. ..	1043	18	9
,, 1872–3	.. .. ..	1077	9	10
,, 1873–4	.. .. ..	1097	14	7
,, 1874–5	.. .. ..	1061	16	10

The average of the four years has been 1070*l.* 5*s.*—but this includes the 30 acres of pasture land at Mickleton—or 2*l.* 10*s.* 6*d.* per acre on the whole occupation. Carrying out the same process as was adopted in Mr. Lane's and Mr. Stilgoe's cases, and reckoning 10*s.* per acre for the cost of the pasture, we have the somewhat alarming figures of 3*l.* 10*s.* 10*d.* as the labour-bill upon the arable land. I will not enlarge upon this subject, but will proceed briefly to sum up our notes.

We had no opportunity of seeing the corn-crops of 1875, but, judging from the stubbles, they must have been very fine. I have already adverted to the extreme cleanliness which was observed at the autumn inspection. The root-crops were all good, the mangolds a heavy crop of excellent quality, and the cabbages remarkably fine; the stock was in good thriving order. Neither wheat nor winter beans were yet sown.

In May we found the corn-crops, without exception, looking well—the fat tegs, for clipping, in a yard eating cut mangolds, which were very sound and good. The ewes and lambs were on the upland pastures, which are most inappropriately called "Thistly grounds." The cabbage was all planted, and the turnips, swedes, and mangolds just showing themselves.

The July inspection saw the May promises fully realised. Seldom have we seen grander crops of wheat and more promising ones of barley than adorned these fields. The wheat especially was erect, reedy in the straw, with finely developed ears filled with plump grain. Of barley there was just enough for quality with a good yield. The root-crops were promising, though somewhat needing rain, and the whole aspect of the farm was prosperous, neat, and business-like. I must not omit to notice a pen of shearling rams (of which Mr. Adkins annually breeds a few for market), which were fine big sheep, and did credit to the Milcote flock. The "Nimble Tailor" peas were fit to cut, and in looking over the large field which they covered scarcely a weed was to be seen.

I have said enough to show that this beautiful farm, with its splendid crops (which were certainly not excelled by any which we saw in the county) and its perfect cleanliness, together with the excellence of its fences, roads, and gates, merits the highest commendation. When, however, we came to inquire into the cost at which this fine appearance is maintained, we were unanimously of opinion that it was beyond the means of most tenant-farmers to meet such expenses and at the same time make a livelihood. The cost of labour and the great expenditure of horse-power were matters which it was impossible for us to omit in our estimate of the general management of the farm; and high as was our appreciation of its many merits, these circumstances, coupled with the indifferent character of the cattle, reluctantly compelled us to withhold from Mr. Adkins the more prominent position which he would otherwise undoubtedly have taken in the competition; but we had the greatest pleasure in recommending that the extra Prize of 25*l.* for special merit be awarded to him, and we believe that—these drawbacks excepted—it would be hard to find a farm distinguished by such excellent crops, by such perfect cleanliness, and by the many other meritorious details, to which I have had occasion to allude.

MR. WAKEFIELD'S AND MR. SIMPSON'S FARMS.

The other two farms which entered into this competition, and which are both upon the estate of Lord Leigh, perhaps deserve more than a passing notice; but after the length to which this Report has already extended, I shall only make a brief allusion to them. Fletchamstead Hall, in the occupation of Mr. William Twycross Wakefield, is about 2½ miles west of Coventry, and adjoins the main line of the London and North-Western Railway to Birmingham. It consists of 218 acres of arable land and 242 of pasture, making a total of 460 acres. The land varies a good deal, some of it being heavyish marl and other lighter turnip-soil. A good deal of the grass land (of which it will be observed there is a large proportion) is of inferior quality, but the arable land is of a kind which, with careful management, grows excellent crops of wheat, of barley, of beans and peas, and of roots. The six-course system is adopted, and the following is the usual acreage of cropping:—

	Acres.
Wheat	80
Barley	20
Beans	40
Oats	10
Swedes, mangold or turnips	25
Rape catch crop	16

Mr. Wakefield is emphatically an improving tenant, and great alterations have been carried out on the farm during his occupation. A large amount of draining has been executed by him, the landlord finding tiles; and many fences have been grubbed up and fields thrown together with the object of improved cultivation. Steam-power is occasionally used for breaking up wheat-stubbles and two years' seeds. A large quantity of night-soil is brought from Coventry; some of it is used for dressing the mowing-meadows, the remainder being applied to the arable land. Grains are used to a great extent, and the stock of cattle being very large, there is a considerable expenditure in other kinds of food also.

The amount so spent amounted in 1875 to 408*l.* 6*s.* 7*d.*, besides which corn, to the value of 229*l.* 14*s.*, the growth of the farm, was consumed. The manure-bill is also large, amounting in the same year to 358*l.* 19*s.* 3*d.*

There were 94 cattle in stock in May, all Shorthorns of a very useful quality. Several of these were barren cows, which were grazing and being fattened off. The cattle and sheep were nearly all getting more or less cake or corn on the land. A few dairy cows are kept and their calves reared, but Mr. Wakefield's general practice is to buy and sell, according to his keep, &c. The sheep-stock amounted to 398 in November and 335 in May. A flock of 130 Oxford ewes is kept, and their lambs go away as fat tegs.

Mr. Wakefield showed his farm under most disadvantageous circumstances. Independently of the unfavourable season, a virulent attack of foot-and-mouth disease, which broke out on his farm in September (introduced by some sheep brought from Oxford market), had played fearful havoc with both his sheep and his cattle. Three valuable cows died from it before our autumn visit, and a fourth, which was such an excellent animal for the dairy that the greatest efforts were made to save her life, was reduced to the most pitiable state, being unable to stand, her feet having fairly sloughed away with the disease. We learned afterwards that she was shot subsequently. The whole of the flock and the herd were more or less affected with this dreadful malady, the effects of which had not entirely disappeared when we visited the farm in May, some of the cattle being still lame and out of condition from the serious nature of the attack.

Moreover, up to the time of the Judges' first visit, Mr. Wakefield had suffered under the material disadvantage of having buildings which were utterly insufficient in their character and the accommodation they afforded for the stock of the farm. This evil, however, was in process of rectification, and we were pleased to find in May a substantial and well-constructed farm-steading just finished, which must prove of great advantage to the occupation.

Mr. Wakefield's figures left us in no doubt that his farm was managed in a manner which was profitable to himself, at the same time that he was permanently increasing the value of the holding; and we were satisfied that a very large quantity of corn and of meat was produced on the farm, and that in every respect it was managed in a business-like and creditable manner.

Mr. Simpson's farm, which is near the village of Stoneleigh and just outside Lord Leigh's park, and which consists of 237 acres of arable and 133 of pasture—a total of 370 acres—does not offer any particular feature of management for description; but its appearance is unexceptionably neat and orderly, and the work is well done. The character of the land varies considerably, some being light and gravelly and some of a heavy marly character. The light land is cropped on the ordinary four-course routine; the heavy on the six-course rotation. Seeds occasionally remain down two years. The sheep are good and the cattle fair. Ten horses are worked, and these are of a useful stamp.

I must, in conclusion, offer the acknowledgments of the Judges to all the competitors for the uniform courtesy, kindness, and hospitality which they received at their hands. The numerous queries which it was our duty to make with regard to points of management and other details by which our decision was partially guided, were all met in the frankest spirit, and received the fullest elucidations which we could desire. I believe it would be difficult in any county to find farms more suitably cultivated and more systematically managed with a view to profit than some of these here described; I am sure that none could produce more worthy representatives of the tenant-farmer class; and I can truly say that we shall long retain with gratification the memory of the pleasant and instructive days which were devoted to the Warwickshire Farms' Inspection of 1876.

(Signed) HERBERT J. LITTLE.
WILLIAM F. HOLTOM.
GEORGE LAING.

XIX.—*Preliminary Report on the Brown Institution.* By BURDON SANDERSON, M.D., LL.D., F.R.S., Professor Superintendent of the Brown Institution.

RELATIONS having now been established between the Brown Institution and the Veterinary Department of the Royal Agricultural Society, it seems desirable, by way of introduction to the Reports which will in future appear in this 'Journal' relating to the proceedings of the Institution, that the Members of the Society should be put in possession of complete information as to its nature and objects, and as to the circumstances which have led to the present arrangement.

The Brown Institution was founded in December, 1871, "for the purpose of investigating, and, if possible, endeavouring to cure the diseases of animals useful to man." The government of the Institution was vested by the Founder in the Chancellor and Senate of the University of London. In confiding to them this trust, he directed that they should erect buildings on a freehold site in London, that they should appoint a Professor, and should also appoint a Committee, which should include, in addition to the Members of the Senate, other persons eminent in medical science. The acting staff consists of the Professor, and Mr. Duguid, who holds the office of Veterinary Surgeon.

The premises at Wandsworth Road consist of several blocks of building, adapted for the reception of animals. The principal block, which faces into a well-drained exercise-yard, comprises a five-stalled stable, four excellent loose boxes, and a stable for cattle. Adjoining this building, and forming another side of the yard, is a dog-house. In addition to these there are two other stables, one of which is now used for pigs, while the other, which is at a considerable distance from the rest, is devoted to the reception of animals affected with contagious diseases.

During the first years of its existence the operations of the Institution were limited to the treatment of horses, dogs, and other smaller animals. The Committee were, however, from a very early period impressed with the conviction that the only way by which the Institution could be made of real value to the community was by devoting its resources principally to one object, namely, to the investigation of those diseases of stock which are especially destructive to property. It was found, however, that the carrying out of this object was attended with considerable difficulties, arising partly from the want of sufficient funds, partly from the absence of any organisation by which the officers of the Institution could come into relation with the owners of stock. In short, it was felt that nothing could be done without the co-operation and assistance of the agricultural interest. When, therefore, in July, 1875, it was learnt that the Veterinary Committee of the Royal Agricultural Society had it in contemplation to undertake investigations relating to the causes, nature, and treatment of the diseases of the animals of the farm, and that they were disposed to enter into arrangements for this purpose with the Brown Institution, the proposal was gladly welcomed, as affording opportunities, which would otherwise have been unattainable, of carrying out in a satisfactory and useful way the benevolent wishes of the Founder.

A meeting for the settlement of preliminaries having taken place on the 2nd of November, 1875, between the Veterinary Committee and that of the Brown Institution, the arrangements were completed at the end of the year. It was agreed, first, that the Members of the Royal Agricultural Society should be entitled to the use of the Hospital at Wandsworth Road, and to the services of the Veterinary Surgeon, Mr. Duguid, on precisely the same regulations as regards payment and privileges as were formerly in force in relation to the Royal Veterinary College, and to the Society's Veterinary Inspectors; and secondly, that, as soon as possible, investigations should be commenced as to the prevention and treatment of some of the most important diseases of cattle.

It having been resolved that the diseases to be first investigated should be foot-and-mouth disease and epizootic pleuro-pneumonia, a munificent grant was made by the Society of 500*l.*, to be expended in the purchase and maintenance of animals, and for the remuneration of such persons as might be employed at the Institution in carrying out the scientific inquiries.

It was not until the beginning of May that I was able to report that we were in a position to commence our undertaking. The nature of the information required, and the conditions under which it was requisite to make our investigations, rendered this delay unavoidable. This will at once become apparent if it is considered that, as regards pleuro-pneumonia, the most important question to be decided is that of the modes by which the disease can be communicated. It is admitted on all hands that it can be given by a diseased to a healthy animal; but the important question whether or not it can be transmitted by means other than that of cohabitation—or, to use the technical expression, by mediate contagion—is still disputed. Its importance consists in this, that the practical utility of every prophylactic measure depends on it. If it can once be shown with a certainty beyond the possibility of dispute, that the presence of a diseased animal is the *sine quâ non* for the spread of pleuro-pneumonia, then it is clear that money spent either on disinfection or inoculation is wasted, and that the only preventive means to be thought of is either isolation or immediate destruction of infected animals.

This being the problem to be solved, it was necessary, above all, that we should begin our work, if I may so express myself, with clean hands, that is without even the suspicion of contagion about ourselves, our premises, or our animals. Our plans were made accordingly. It was determined to begin by purchasing a sufficient number of perfectly healthy animals of different kinds: viz., two milk-cows, two calves, and four other animals of different ages, so selected that all the individual conditions likely to affect liability to infection might be represented. With the kind assistance of Members of the Veterinary Committee, I was able to make these purchases in a most satisfactory manner.

Three months having elapsed since the arrival of the purchased animals at the Brown Institution, we feel that we may now regard the immunity of our stock from infection as absolutely certain, for this period exceeds the highest estimate that has been made of the period of incubation. We are now, therefore, about to commence our experiments. No living source of infection shall come near our animals or premises, but we shall try in succession every channel of mediate contagion known to us, using in our experiments all that deliberation and caution which the consideration of the importance and difficulty of the inquiry enforces on us.

As regards foot-and-mouth disease, we have already made a number of experiments on different animals, but it would be premature to make any statement of the results.

Brown Institution, August 1870.

XX.—*Report on an Inquiry into an Outbreak of Anthrax Fever in a Flock of Ewes and Lambs, the property of Mr. Gaitskill, Hall Santon, Cumberland.* By W. Duguid, M.R.C.V.S., Veterinary Inspector of the Society.

On the 20th of May I visited Hall Santon, and examined a flock of ewes and lambs belonging to Mr. Gaitskill.

Previous to my leaving London, I had received information that in the course of five days, from the 13th to the 18th of May, no less than 26, out of 94, lambs and 3 ewes had died. On the morning of the 19th the mortality was found to have increased to an alarming extent, 12 more lambs and several ewes having died in one day.

When I arrived on the 20th, the number of deaths was still increasing; and by the evening, when I left, two-thirds of the lambs, besides a considerable proportion of the ewes, had succumbed.

From the very rapid course of the disease, the great mortality, and the fact that none had recovered, there could be no doubt that they were suffering from some form of blood-poisoning.

The symptoms described by the owner, and observed by me in the affected animals, clearly indicated the nature of the disease, viz. anthrax fever; and the post-mortem appearances confirmed this opinion.

When first affected the animals seemed dull, head depressed, ears dropped, appetite lost, rumination suspended, back arched, breathing accelerated and somewhat difficult, eyes bloodshot, fever considerable, secretions scanty, with tendency to constipation.

As the disease progressed, these symptoms became more marked; the animal had a great disinclination to move, showing a peculiar stiff gait, often amounting to actual lameness in one or both hind legs. In from 24 to 48 hours, often less, the disease had run its course, and the animals would be found lying in a convulsed state prior to death. I examined a number of the dead animals, and had one or two of those in a dying state killed for examination.

In all cases there existed more or less congestion of the lungs; this was most marked in the lambs. The most constant and characteristic lesion observed was the extravasation of blood under the serous membranes, and in the tissue of the heart, and sometimes even in the voluntary muscles.

With regard to the state of the digestive organs after death, the stomach was full, showing that loss of appetite and suspension of rumination had not existed long before death. In some of the animals in which the disease had not run its course quite so rapidly, extravasations were found into and under the mucous membrane, actual hemorrhage having taken place, and the intestinal contents being tinged with blood.

Mr. Gaitskill's breeding flock was divided into two lots, and this mortality was confined to one of these, the other portion of the flock remaining in perfect health. On inquiry I found that both portions of the breeding flock had been fed and managed in exactly the same way up to a certain date after lambing; and that the portion of the flock in which this outbreak occurred had been moved to some fresh pasture, and within a few days the first cases were observed. This pasture land, which I found in very bad condition, mostly peaty soil and very imperfectly drained, had only recently come into Mr. Gaitskill's possession, and had been very much neglected by the previous tenant.

Mr. Gaitskill informed me that a somewhat similar mortality occurred among sheep on the same pasture last year, previous to its coming into his hands; and likewise that, in the earlier part of the present season, he had placed some Irish cattle on it, and they had very soon shown signs of illness.

The above facts are, I think, sufficient to prove that the blood-poisoning was connected with the special pasture; but whether the food, the water, or both, were the immediate cause, it would be difficult to determine.

Black Quarter is, I am told, often seen in the district; and, from the peaty nature, low-lying and unimproved condition of much of the land, other forms of anthrax are probably not uncommon.

The history and nature of this outbreak, as well as the characteristic appearances of the district, correspond very closely to those of some of the invasions of anthrax observed in the so-called anthrax districts on the Continent.

When such virulent forms of disease present themselves, the treatment of the affected animals is usually most unsatisfactory, and prevention must therefore be chiefly aimed at.

In the present instance, Mr. Gaitskill had acted very wisely in removing the flock from the pasture referred to, as soon as the few first lambs had died, to some sound pasture near the homestead. In addition to the separation of the diseased from the healthy, and the immediate removal of the dead and dying from the fields, I recommended small doses of purgative medicine where necessary, to be followed up by small diuretic doses.

In reply to a telegram of mine, asking Mr. Gaitskill to place all the affected animals under shelter, and to feed them with mangolds, &c., for a few days, he wrote on the 23rd, stating that during the previous night only one lamb had died, and the flock generally looked better. Some of the affected animals were also, he said, recovering.

During my inquiries regarding this case, I have received information that the previous occupier of the land, referred to in this Report, totally disregarded all ordinary sanitary arrangements with regard to the disposal of his dead animals. The carcase of a cow, in 1874, was buried so close to a drain, that recently, when it was opened, the remains of the cow were partly dug up. This drain empties itself, I understand, into an open stream, which may be perhaps a water-supply for animals. In 1875 the sheep that died, and also the carcase of a mare, were not buried at all, but were left on the surface to be eaten and dragged about by dogs, birds, &c. Surely such conduct deserves punishment. Such negligence might, in the case of animals dying of contagious diseases, prove a source of incalculable mischief to neighbouring farmers.

XXI.—*Report on the Exhibition at Birmingham.* By W. H. Wakefield, Esq., of Sedgwick House, Kendal, Senior Steward of Live Stock.

The Royal Agricultural Society's Country Show for the year 1876 is over: not so, however, the pleasant memories which it has left behind. Judged by the standard which is embodied in that very self-evident truism, "Nothing succeeds like success," the Meeting has been everything which could be desired.

In fixing upon the place where the Show is to be held, the Council know full well beforehand whether they will be in or out of pocket; but they are, and must be, guided to some extent by the consideration—Where can the Show be held with the greatest advantage to those interests which are chiefly affected by it? To this consideration, however, there is a limit, and the questions of ground, accommodation within easy reach for visitors, and gate-money have to be debated; the two first on all occasions, the last from time to time. The funded property of the Society has enabled it to meet so far the financial question; but the size of the Show and the number of visitors must necessarily limit the number of towns where it is either possible or convenient to hold it, and, in point of fact, the Council will shortly be called on to take this matter into their serious consideration, with a view to deciding whether, under the actual circumstances of space and numbers, the present system of selection should be continued. But here let me say a word or two, to dissipate the popular idea that *the Society is the Show.* The 'Journal,' containing as it does such a store of useful and interesting information, forms a most important part of the work of the Society; and if questions of finance were to press much more strongly than they ever will, I should say, speaking now only for myself, let the Country Show be in abeyance for a single year, but never stop the 'Journal.' Doubtless there are hundreds, if not thousands, of Members who would be only too glad to double or treble their subscriptions, but this is not really needed; much better let us replenish our coffers with funds drawn from new Members attracted to us by our increasing usefulness.

I have said that the Birmingham Meeting was a great success, and, indeed, how could it be otherwise with a Local Committee constituted as it was, and working as it did. It strikes me that a few lines may well be devoted to this subject, so as to put permanently on record in this 'Journal' what they have done, and how right well they did it. It is not unnatural to suppose that the locality could produce plenty of men with the ability and energy to do all that was necessary to command the success which has been achieved.

The site was the first question, and how well that was settled we all know to our infinite satisfaction; but it is by no means generally known how much had to be done to secure it, and then to make it available. But I am wrong in speaking of difficulty in securing it; though there might have been anywhere under similar circumstances. A portion of the ground was the property of the Corporation, and they, acting on behalf of their constituents, the general public of the immediate locality, not unnaturally took a liberal view of the subject for which they would ask no credit, though at the same time, I may just observe, there are two ways of doing a thing, and they did it in the best and pleasantest way. But a considerable portion of the ground was in private hands, and therein was the key to the situation. How the owner of these lands was approached on the subject, we do not know; but we *do* know how he dealt with it. What financial sacrifice he made to meet the general wish that the Show should be held in Aston Park cannot be calculated in £. *s. d.*, nor indeed would a man possessed of so liberal a spirit wish to be glorified by such a calculation.

Well, the site having been secured and fully approved by the Council of the Society, the Local Committee set to work on it. That its capabilities were great, no one could deny; but it required the exercise of no little faith to realise this, and the expenditure of a large sum of money to accomplish it. But "where there's a will there's a way," and so it came to pass that the Royal Agricultural Society's Exhibition for 1876 was held on a ground equal, if not superior, to any former site. Only those who knew the ground before it was taken in hand could appreciate the work that was accomplished. And when the work was done, and the ground occupied for the purposes for which it was designed, the scene that presented itself to the spectator looking down from the terrace of Aston Hall was most striking, and will be long remembered. The irregular shape of the ground, though in some respects not quite so convenient for arrangement, added to the picturesque effect; and this, too, was heightened by the presence of a sheet of water, along the margin of which were erected the various structures more particularly belonging to the Horticultural department. Here and there, at the lower end of the Park, were some grand old elm-trees, which did good service in the way of pleasant shade; and so there was presented a charming combination of wood, water, and undulating ground, the like of which was never before presented by a Show-ground of the Royal Agricultural Society and probably never will be again.

But all this involved a heavy expenditure, and from first to last there was laid out on the ground about 4500*l.*, a considerable portion of this being spent in the purchase of land on which to construct railway sidings that were absolutely necessary for the convenient delivery and removal of animals and machinery. This land has since been sold to the adjoining Railway Company without loss; but the fact remains that the very substantial sum of more than 8000*l.* was raised locally for the general purposes of the Show.

With such spirited local effort in the way of preparation, it might readily be expected that the Show itself would be a success, and so indeed it proved, as has been already stated at the outset. The official Report, which will follow this introduction, supplies full particulars as to the details of the Show. May it be the happy lot of future chroniclers to have such materials to work upon.

But I must not close without an acknowledgment of the courteous hospitality shown to the Council of the Society by the Mayor of Birmingham, and also by Mr. Alderman Biggs; and I would, on behalf of my colleagues and myself, express our warm thanks for their magnificent entertainments. The family portraits of the Holts looked down on us as we dined in the long oak-panelled gallery of Aston Hall, and one could not but reflect on the vast progress made in scientific agriculture since the time when, from the terraces of their grand old Tudor home, they looked out on the beautifully-wooded landscape, stretching far away, but now gradually contracting on all sides —the beautiful giving way to the utilitarian.

One word more, and I have done. The maintenance of order on the Show-ground was, as usual, entrusted to a select body of the A Division of the London Police; but considerable doubt was expressed as to whether that force would be sufficient to cope with the unruly elements which were expected to be present on the shilling days: so much so, that, speaking for myself, I looked forward with some apprehension to making an intimate acquaintance with the inhabitants of the Black Country, more especially the Birmingham "Roughs." Never in my life was I more agreeably disappointed. With few exceptions, and those of a very trifling character, there was absolutely no disorder, and with over sixty thousand people, pretty closely packed, this is saying a great deal. I believe I am capable of forming an opinion on a matter of this sort, and certainly I had the opportunity; and all I can say is that I failed to see that which I had been led to expect. The people were there most assuredly, and their behaviour was an example to be followed. Doubtless this is due to the high influences which are now so extensively brought to bear with advantage to us all; and if we had only more men of the same stamp as the Rev. Canon Wilkinson, D.D., who conducted our Sunday-morning service, we should make more rapid strides in the right direction.

And now I take my leave of the Royal Show of 1876, with my best thanks to all—herdsmen, horsemen, grooms, and attendants generally—for their cordial help in the work. The mantle of the happily still extant Mr. Brandreth Gibbs fits well on the shoulders of Mr. Jacob Wilson, and I would say of him, last, though not least, long may he remain in his present post of Steward of General Arrangements, the right man in the right place.

Sedgwick, August 28th, 1876.

XXII.—*Report on the Exhibition of Live Stock at Birmingham.*

By JOSEPH DARBY.

THE Birmingham Meeting of the Royal Agricultural Society has been proclaimed to the world a grand success, but in reality it may have been so to an extent far exceeding the popular impression. The fact of 163,148 visitors having been attracted to such a magnificent display of stock and implements is, of course, in the highest degree satisfactory, and the Council may be heartily congratulated on having improved their financial position. But there were nobler ends to be worked for and secured than these, otherwise our largest towns and densest masses of population would always be selected in fixing the places of meeting. And it is because Birmingham so fully met other wants, in being the acknowledged centre of a very wide-spread and highly important agricultural district, that results follow of truly national scope as affecting the arts of husbandry and stock-breeding. Thus the Royal Agricultural Society has discharged its educational functions most effectually, and has earned the general gratitude in promoting so thoroughly one of the greatest interests of the country and of the age.

Statistics show that the large Birmingham attendances have been once, and once only, exceeded; as at Manchester they reached 200,733,* while the Leeds Meeting had 145,738 visitors, and the Newcastle 144,683; but at neither of these large towns was there anything like such large entries of stock as at Birmingham. The Leeds entries were 299 cattle, 254 horses, 359 sheep, and 115 pigs; making a total of 1027. At Newcastle there were 381 cattle; but other stock were less numerous, the total reaching 1099. Manchester boasted of 338 cattle, 384 horses, 461 sheep, and 132 pigs; making a total of 1315; but at Birmingham the numbers reached to 465 cattle, 424 horses, 407 sheep, and 203 pigs; the total being 1499.

Not only can this be fairly claimed, but also that in Aston Park there was a fuller and grander representation of the leading breeds of stock, taken generally, than has been experienced since the Battersea Show of 1862, which was distinctly international in character, and consequently exceptional. At Bedford, in 1874, there were more sheep and pigs, the former numbering 486, and the latter 226; but the horses were only 412, and the cattle 403; consequently although the larger total of 1527 is described, the Bedford entries scarcely stand so high in importance. It is, indeed, not difficult to prove, then, by a comparison of numbers, that a fuller and more uniform display of stock has only taken place at Battersea Park in the great year of the International Exhibition, when all parties strained their utmost to swell the exhibition to an unprecedented extent. But of the 1986 entries contained in the Catalogue on that occasion, 183 were foreign animals, while 238 were sent over the border from Scotland; thereby reducing the purely English exhibits to 1595. At Worcester, the following year, the numbers shrank within normal limits to 1219, and even the Show held at that place was accounted a grand one.

A better site than that chosen for the late Show could not possibly have been selected, and few occasions of a similar kind have ever been productive of more genuine unalloyed enjoyment, attributable, no doubt, to a concurrence of fortuitous circumstances in the brilliant weather, the beauty and adaptation of the Aston grounds, and, above all, the pre-eminent suitability of the metropolis of the Midlands to meet the main objects of the Exhibition. No doubt the fact of the Show being held in the very heart of the kingdom, and at the populous centre of an important breeding district, would have insured in any case one of the largest displays of stock. Still, all must admit that sunshine and bright skies contributed in no small degree to insure those large attendances which have so naturally replenished the Society's coffers, while pleasures were enhanced, duties made more agreeable, and, above all, the health and well-being of the valuable stock on exhibition were greatly promoted by the fine weather, which afforded so remarkable a contrast to the deluge experienced the preceding year at Taunton. The Birmingham Meeting is consequently begirt with golden associations calculated to impress the memory with pleasurable emotions, while it will not be difficult to show that, in the admirable qualities and rare excellence of the numerous beautiful animals exhibited, a stand-point in the annals of progress has been furnished, to be looked to for comparison after many years.

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* It should be mentioned, however, that this number includes 11,631 registered entries of 2864 season-ticket holders; whereas at Birmingham, the entries of the 443 season-ticket holders were not registered.—Ed.

HORSES.

Probably in hunters, and other riding horses, the Birmingham equine display has in several instances been excelled, but in horses of a stouter build adapted for field and road work, or for breeding superior cart-colts, it has been seldom, if ever, surpassed. No greater benefit can possibly be rendered to partially inexperienced farmers than to have an opportunity of viewing such a superior collection of agricultural stallions as appeared in Classes 1 to 7, comprising no less than 89 entries; a number well-nigh double that usually entered; for at Taunton there were 46; at Bedford, 76; at Hull, 56; at Cardiff, 40; and at Wolverhampton only 32. These animals, however, were not only numerous, but a large proportion of them were of excellent form, beautifully moulded; many possessing the best blood of which the country can boast.

The two-year-old Stallions, not qualified to compete either as Clydesdale or Suffolk, formed a good class of 19 entries, with the blood of many an old favourite represented. The pride of place was awarded to the Earl of Ellesmere's "Young Waggoner," who had previously been highly successful at Doncaster. This is a powerful young horse, with massive frame and strong limbs, which he can use with activity. Mr. Crowther was placed second with a son of "Honest Tom," worthy of his sire; for "Carleton Tom" is well-built, capitally ribbed up, and decidedly handsome. The third-prize stallion, rather small and compact, but powerful, with plenty of bone, is also the son of an old favourite, "A 1." "Ploughboy," the reserve horse, possesses high merit in being well-shaped, and powerful in form and limb. The older class of the same kind was equally deserving, and still greater in number, looking worthy of a Royal Show as the animals were led round the ring. Here the prize-horses were altogether very *distingué*, having made noteworthy achievements before. The handsome mottled-brown 8-year-old "Nonpareil" made his mark long ago, and owns no end of honours. With his beautiful front, lofty style, and grand form, uniting high qualities and symmetry to strength, it would be difficult to find a superior, and Mr. Wynn may well be proud of him. Mr. Statter's "Young Champion," young, alas! no longer, after having seen nine summers, was well in place as second, the position he held at Bedford. That he is massive, well-built, and powerful, yet active, is well known, from his having been a frequent prize-winner since he appeared before the Royal Judges at Oxford as a three-year-old to take a second there. Yet in everything except colour it may be fairly doubted whether the third horse, Mr. Marsters's "England's Wonder," is not his equal. The latter seems a model of almost faultless symmetry, combined with grand frame and stalwart limbs; but his light strawberry-roan colour is made the more remarkable by white face and legs; and the latter, not a few who profess to know something about good features, have a decided objection to. Still this has not marred his career in certain quarters, as it appears he has won four Champion prizes during the past three years. And he not only wins prizes himself, but begets sons and daughters with a striking resemblance to himself, to reap other Show-honours. One of these, a two-year-old colt, has recently been sold for 500*l.* The reserve horse, Mr. Brigg's "Heart of Oak," well deserves a word of mention, for he was the premier in the same class at Bedford. He is an upstanding, fine fellow, with strength and activity, and whether or no slightly overtopped, as some assert, is still a good one.

Special conditions environed Class 3, which were: that the prize-winners shall travel next season in Warwickshire; one through the north and the other through the south of the county. This was but a small class, although the local men made the bait rather tempting for celebrities to come from afar. Mr. Frederick Street's "Young Sampson," who took first prize, and is allotted the northern division of the county, is, however, a showy, powerful animal; and Messrs. Yeoman's "Pride of England," a lengthy, well-shaped horse, on short legs, being placed second, will go to the south side.

Neither Clydesdales nor Suffolks were in any great force. Both first and second winners in the two-year-old Clydesdale Stallion Class are by the same sire, and were bred by Mr. Lawrence Drew, although the owner and exhibitor of the second horse was His Grace the Duke of Richmond and Gordon. Style belongs to both. Mr. Drew's has the neatest character, but the Duke's has the stoutest frame. His Grace also owns "The Earl," who took the reserve, another animal of good form and considerable power. But Mr. Graham's "Baron Lonsdale," from Cumberland, displayed nice style, and richly deserved the third prize. The three prize-winners in the All-aged Class were alike distinguished by grand forms and capital developments. Mr. Forshaw's "Ben Lomond," after winning four first-prizes in Scotland, has recently been brought South, and now has his home in Nottinghamshire. "Young Lofty" and "Prince Albert" are well-nigh equal in good qualities. It may be worthy of remark that the first and second horses in the younger class, and the chief winner in the older, are by the same sire, the celebrated "Prince of Wales," for which the highest price ever known to have been realised for a Clydesdale sire was obtained. The fact shows that "good blood will tell."

Suffolk stallions, although rather select, were represented by some admirable specimens of the breed. Mr. Garrett's handsome son of "Cupbearer the 2nd," has legs clean as a hunter's, although so big, and a sweetly modelled form; he is powerful too, and has stalwart limbs, although the very personification of activity. He took the leading honour in the two-year-old Class; and carrying off the 100 guineas challenge cup at Saxmundham is among his prior achievements. Mr. Toller's "Evergreen," of compact build and very neat, although smaller to the eye, had a deeper carcass than his conqueror, but less bone in the legs. Two other very good colts were placed after him, and one of them, Mr. Alfred Cracknell's powerful "Champion," so well answers to his name in the East of England, that he won Suffolk County firsts in 1874 and 1875 and the Norfolk first prize this season. The other is Mr. Manfred Biddell's "Jasper." The latter has a straighter back than most, and his frame is well built and strong. In the All-aged Class a sire of good model and beautiful style was found in Mr. H. Wolton's "Royalty." In symmetry he seemed almost faultless. "Viceroy," the second horse, was nicely moulded in shape, too, with a prepossessing feature in a rich dark colour; and Sir R. Wallace's "Prince Imperial," and Mr. Byford's horse made up with them a nice quartette for honours.

The agricultural mares with foals, not qualified to compete as Clydesdales or Suffolk, formed a strong class of fifteen, several of whom possessed merit. The Judges selected a small but very well built, compact, and powerful Norfolk mare, called "Lioness," for the place of honour; "Cardiff Lass" and "Princess of Wales"—the former from Bedfordshire and the latter from Lancashire—taking the other prizes. But the Earl of Ellesmere's "Honest Lass" and "Diamond" were deservedly commended, and these five were all well-shaped powerful animals. If the Clydesdale and Suffolk mares with foals were few, they were, at least, noteworthy for the merits of "Mrs. Muir" and "Darling," in Class 12, and "Pride," in Class 13. Four-year-old geldings and fillies were also in weak force; but three-year-olds, on the contrary, were capitally represented. Among the former there was, however, one horse, at least, whose claims are far above ordinary character for the first-prize taker, namely, Mr. Bramley's "The General," which owns an immense massive frame, with enormous strength. This Lincolnshire stallion has won a great many local prizes. The first three-year-old horse, Mr. Smith's "The Major," was also big-sized and powerful; he has taken other firsts at Norwich, Doncaster, and elsewhere, and unites good qualities to substance. The second animal in this Class, Mr. Pulleine's powerful black filly, deserves a prettier name than "Patch," for she is very handsome, as well as grand in frame. The Earl of Ellesmere's bay and brown fillies, one of which took the remaining prize and the other reserve, were very notable for pretty style and nice character. Mr. Lawrence Drew took another first with a splendid three-year-old Clydesdale filly, the Earl of Strathmore's "Nell" being placed next her. In the Class for Suffolk fillies, of the same age, two "Empresses," one belonging to Mr. W. Byford and the other to Mr. J. Toller, contended for the crown, and their claims were so evenly balanced that the Judges took considerable time before deciding to which the preference should be given.

Of younger colts there were highly respectable musters, no less than 21 two-year-olds being entered in the general Class—a tolerably good lot, headed by Mr. C. Marsters's beautiful filly, a daughter of the third-prize strawberry-roan stallion in Class 2, previously alluded to as the creator of good stock. She is very like him both in colour and form, having well-shaped limbs and immense power. Mr. H. Smith's powerful bay gelding, "Robin Hood," was placed next her; and a handsome filly, belonging to Mr. H. Tomlinson, received third prize. With the Clydesdale two-year-old fillies—a good Class of six—Her Majesty's "May" appeared; but not having a thoroughly perfect front, although good behind and with a capital middle, she did not win. Mr. Drewitt's "Rose of England" excelled in well-proportioned strong limbs, and was exalted to the place of honour; Mr. Lawrence Drew producing another powerful good colt to take second prize. The parents of "Rose of England," "Duke," and "Ventnor," were both prize-takers. The Suffolk two-year-olds formed a pretty lot of five. Mr. W. Toller furnished the prize-winners in "Ada," compact and handsome, and "Myrtle," with capital shoulders, was almost equally good. Yearling cart geldings and fillies formed another large Class of 15 entries, of no small merit. The Earl of Ellesmere's very fine bay filly, which has immense substance for her age, gained first honour; the showy chestnut filly "Princess," belonging to Mr. J. Walter, M.P., which has carried off firsts this season at Abingdon and Henley, received second prize, while the third was Mr. Miller's "Hebe," a lengthy and good bay filly.

The remarks of the Judges are as follow:—

As a whole we consider the show of carthorses good, the weak part being the Clydesdales, which were not up to the standard of excellence we expected to have seen after the glowing reports we read, and the marvellous prices they make.

Classes 1 and 2 we noted *good*, with a strong entry of 16 each. No. 12 is a fine upstanding colt, with excellent fore-legs, bone, and feet, and, but for misplaced hind-legs, would be quite first-class. No. 5 is a stylish bay, hardly wide enough, elbows tucked in, with light thighs. No. 4 is a remarkably short-legged heavy colt, good bone, but a little short of hair. No. 24, in the older Class, is a grand specimen of what a carthorse should be—short-legged, a long horse, with a short back, a rare constitution, and active. No 36, the chestnut, is a wonderful mover, with great muscular power and substance, though a trifle low in the back. No. 39, the roan, is very level and quite a carthorse, but has unsightly-looking coronets, which the veterinaries passed as sound. No. 22 is a big, commanding-looking one, but too high on the legs.

Class 3.—We may congratulate North Warwickshire farmers that, by offering so good a prize as 60*l.* they have secured nearly the best horse in the Show to travel their county. He will no doubt do great service to the county, for he is very good-looking, active, with a level top and famous feet and legs. No. 48 is of a different type altogether; however, he is very short-legged, with good bone.

Classes 4 and 5 we were much disappointed in: they were not good. Nearly every one had badly-formed fore-legs, many calf-kneed. No. 59 is just a useful, hardy, short-legged colt, very handsome, but scarcely looks a young Clydesdale. No 52 has short ribs, and No. 55 is a big plain one. No. 63, in the older Class, has nothing particularly striking about him, unless it is his small pony head. No. 60 is of a better type, and has probably been a good horse; but his day is gone for the Showyard, his sides and back have drooped away. He has, however, the best legs exhibited of this breed. About the best in the class, No. 14, was lame.

Classes 6 and 7 came out in strong force, and the breed was well represented, the county prize horses being successful. No. 76 is a colt of very great power and activity, full of bone, with capital feet and a rare constitution, promises to grow to a grand horse. No. 73 is full of quality, with a rare constitution, a good mover, but a trifle short of bone. No. 67 is a nice active colt. No. 79 is a true Suffolk stamp, and short-legged, hardy, and active. No. 84 is very active, with capital feet and legs, and being only three years old should grow to a fine horse. No. 80, another three-year-old, is a stylish, level colt, but a trifle high on the leg.

Class 11.—In awarding this prize it was very difficult to satisfy ourselves, there being so much difference in the mares and the foals; some of the best mares have very young foals, and are bad mothers. We would suggest the prize should be given for the best mare, with foal at foot. No. 120 is a short-legged four-year-old mare, a good stamp, a good mother, with a promising foal. No. 123 is a hardy sort, a trifle short of bone, with a wide short-legged foal. No. 122 is rather a high four-year-old, with flat short ribs, and a foal of about the same character. No. 126, the Reserve Number, is a grand mare, with only a middling foal, short of condition; probably mother not a good milker.

Class 12.—No. 133 just a useful mare, with an extra good foal.

Class 13.—No. 134 a grand mare, with a very promising foal.

Class 14.—No. 138 won easily. A good specimen of what a carthorse should be.

Class 15.—Noted by us as a very good class. The winner, No. 147, is a very big, heavy, level colt, very active, with fine limbs. No. 152, the black filly, a very meritorious one, and Nos. 155 and 154, are both short-legged, hardy, full of quality, with not the best of feet.

Class 16.—No. 160 is a very short-legged plain filly, with famous legs and feet; but we doubted if she was so pure a Clydesdale as No. 158, which has a very level top, but is rather high on the leg.

Class 17 was a very good one. Though only three of them, the competition was very close, and a third prize was recommended. They were all good specimens of the breed.

Class 18.—A strong competition. The winner, No. 182, is a very active, short-legged, level mare, with excellent feet and legs, and but for her hind-legs would be quite first-class. No. 165, a bay gelding, a great heavy colt. No. 181, a level, neat active mare, rather light of bone.

Class 19 we remarked a bad class.

Class 20.—Four very neat fillies, of good shape and quality. No. 193, the winner, is a very short-legged wide one.

Class 21.—A strong competition of thirteen. No. 206 is a stylish filly, with capital feet and legs, and a good mover. No. 198 is a neat chestnut, not so much bone, but a very taking one; her hind-leg action is not good.

G. M. Sexton,
A. Turnbull.
S. Wade.

Taking thoroughbred horses and hunters next, it may be remarked that none of the classes were barren of animals of a superior description, although several contained very varied materials. Among the stallions there were none like "Citadel," the grand old prize-winner, who has added another laurel to his numerous successes. The others come of more moderate pretensions; but the second horse, "Waddington," took a first at the Gloucestershire Show. The hunting-mares, it will be found, gave reasonable satisfaction to the Judges, three or four superior animals being among them. Mr. Miller's neat stylish grey, the pretty "Flora," to whom the chief place was assigned, ought to breed a good hunter; and she had a very nice foal at foot by "Carbineer." Of quite different character, although well-nigh equally meritorious on the whole, is the powerful, more grandly-shaped "Bowling Green," who brought second prize to Lord Falmouth. "Miss Saurin" and "Insecurity," the remaining mares noticed by the Judges, also displayed excellent character, although scarcely up to the standard of the first two.

A gaily-stepping, fleet-bounding, daughter of "Laughing-Stock" appeared in the two-year-old filly class, namely, the neat, sweetly-styled, "Young Kate," so lithe in form, yet muscular and full of nerve, who at once asserted her right to pride of place. "Mignonette," of stouter build, but active and playful, seemed also a beauty, but could only be placed second; with "The Queen," another daughter of "Laughing Stock," very shapely, with good limbs, taking reserve. Then, again, the three of the three-year-old hunter-mares whom the Judges honoured were above ordinary merit. Mr. Tattersall-Musgrave's "Triumph," own sister to "Talisman," and one of the Alexandra Park winners, has pleasing style, with plenty of fire. The dark-grey "Belona" is decidedly handsome, with considerable bone and blood-like quality: while "Rosalind," the reserve mare, is a very good one, and does honour to the "Laughing Stock" blood. Both two-year-olds and three-year-olds mustered in force, and the Judges specially remark that "several" were "very promising animals." The Duke of Hamilton's "Boynton," who has a grand form and wonderful development for a two-year-old, had probably an easy victory in the former class; with Mr. Oakeley's stylish "Bird Tenter" making a good second. But in the latter the claims of three or four of the animals not honoured stood very high. The post of pre-eminence was assigned to Mr. Rickerby's "Captain," own brother to the first two-year-old filly, and having the same gay style and nice action. Mr. Bailey's "Precocity," with lengthy form and shapely limbs, came next, followed by Mr. Watson's "Sportsman" as the reserve horse. The contrast between only four entries of mares and eighteen of geldings in the classes for four-year-olds seemed very marked, and among the eighteen there were several good hunters. These were headed by Lieut.-Col. Barlow's "Van Dyck" and Mr. T. H. Hutchinson's "Glengyle," both of whom had many favourites, for they are a couple of prime ones, the comely shape, grand action, and substance of the former causing him to have first place; but the latter is exceedingly handsome, and proved himself a splendid goer. "Glengyle" has not often been beaten, and had a most successful career in the Showyard last year. Mr. Jones's black horse and Mr. Hone's chestnut, who were also honoured, had merit far above par. In short, it was a thoroughly good class, "one of the best," say the Judges, "in the Yard."

However, it was the next, for five-year-old mares and geldings, which produced the animal to win the cup, as the best to be found in any of the hunting classes. "Jester" is every inch a first-class hunter, with beautiful form, strength of limb, admirable action, and almost every other good quality combined. It will be found in the estimation of the Judges that this splendid animal is almost perfection. What a pity, it seems, such was not preserved a stallion! and the remark applies not solely to him, but to "Glengyle," "Van Dyck," and several other of the geldings exhibited in Aston Park. There were three other grand horses in "Jester's" class who formed with him a truly splendid quartette. These were "Harkaway," "King Charming," and "The Lancer;" the conversion of either of which into a gelding was a national loss. The weight-carrying hunters had among them a gelding of uncommon power and magnificent form, belonging to the Duke of Hamilton, who might have been called "Wonder" instead of "Winder." Strange to say, he has no pedigree. Associated with him were "Rossington," "the Old Squire," and a strong, shapely, dark bay, also without pedigree, belonging to Mr. R. N. Philips, M.P., all good ones.

The Judges presented the following Report:—

The class of thoroughbred stallions was small in number, and not good in quality, with the exception of the first-prize horse, and we did not consider that there was sufficient merit to give any commendation in the class. The hunting brood mares were a mixed lot, there being three or four very good mares for the purpose of breeding hunters, but several of the entries were not in any way qualified for entry in the class. In the classes for two and three-year old hunter-colts and fillies there were a number of very good young animals exhibited; and also we found in these classes many animals whose owners must have a very indistinct idea of what constitutes "a hunter," or they would not have sent their animals to the Exhibition under that name. The class for three-year-old hunting geldings contained several very promising animals. The four-year-old hunting mares were not a good lot, but the same aged hunting geldings we consider one of the best classes in the Yard, the prize horses being of very great merit. In the class for mares and geldings to carry not less than 12 stone the entry was good, both as to numbers and quality, the four prize horses being of more than average excellence; and the same remarks may apply to the heavy-weight hunters, which were a very good class, and would do credit to any Exhibition. The hunters not exceeding 15½ hands high were a small class, and poor in quality. The cup for the best hunter in Classes 29 to 33 we awarded to No. 317, a horse which the majority think pretty nearly a perfect animal.

J. B. Booth.
E. Foden.
T. Pain.

Hacks, roadsters, and ponies, were not so numerous as might be deemed desirable, but some of the animals produced were of well-nigh unexampled merit. One, at least, fully answering to this description was to be found in Class 9 for stallions suitable for getting hackneys. Mr. Balderston's "Norfolk Hero" is an old favourite, and, after winning two Royal firsts before, it is not surprising to find him taking another chief honour. He appears the very model of a good roadster, so stout is he, but uses his limbs so well, and with a style which fully justifies his being here. Messrs. Ridgley's "Fireaway 2nd," one of the best animals in the class, was disqualified, from being above 15 hands in height. This brought to the fore Mr. Statter's "Perseverance," and Mr. Roundell's "Sir George Wombell," both of whom displayed well in action on the ground.

The pony stallions formed a pretty class, with "Almanza" first; strong in bone, with handsome style; the pretty "Lad of Mancombe" second; the diminutive, but prepossessing, "Tricstrin" third; and the stouter "Llanderfel" fourth; who is charming in appearance although stout. But something more than mere prettiness is required to constitute a really good pony-stallion; and the Judges considered there was no particular merit except in the first-prize one.

Hackney mares with foals were very creditably represented, and Mr. Sherratt's "Polly," Mr. Cook's "Portia," Mr. Kingsley's "Kitty," and Mr. G. D. Badham's "Gipsy," formed a capital selection, which was made for honours. "Polly" has neatness, and very nice character. "Portia," who has won firsts in the Lincolnshire and at Doncaster, is grand in form. "Kitty's" comely shape and excellent character, with better legs, would have won her a higher position; and neatness, with a pleasing style, is to be discovered in "Gipsy." The pony-mares were very few, and, it may be added, select, those being of high merit. "Pet," who took first prize, may be regarded as a gem of strength and quality combined with handsome form. "Kitty," the second pony, is also highly meritorious with her nice character; and the third, "Sally," displays substance in a well-built frame.

Hackneys over 15 hands and up to 12 stone were of a mixed character, but some good animals were among them; Mrs. Frisby's "Eclat" being neat and well shaped, while Mrs. Malcolm's "Homespun," and Mr. Knowles's "Romeo," were of excellent character. The smaller lot up to 14 stone in the next class possessed a great attraction in the Prince of Wales's "Coomassie," who was allowed to be very handsome, and to use his legs admirably. His model was not, however, altogether so perfect as that of Mr. Statter's "Surprise," to whom the chief prize was awarded. Probably the Prince's horse had not quite recovered from his long sea-voyage. It was generally remarked that he looked far better in action than in his stall, but there was no discredit in being beaten by such a grand mare as "Surprise," who possesses great power, embodied with a contour well-nigh perfect. The third horse, Mr. Cook's "Rosalind," seemed also above average merit in bone, stamina, and nice character, and three such prize-winners would redeem any class, however small, from insignificance.

The weight-carrying hacks and roadsters mustered in greater force, the entries reaching to fourteen. The grand feature of the class consisted, however, in the intrinsic excellence of the prize-winners. Mr. Wiley's "Bob" is a most remarkable animal, a a very "tower of strength," as the Judges truly observe; very roundly made, and neatly put together, although so strong; and every inch of him seems good. Miss Adelaide Harrison's "Major" in general character is not unlike the chief winner, and it is not often two animals so grandly built and nice in form are found in the same class. But Mr. Harrison's third-prize mare, "Lady Jane Lindsay," had also sterling merits. Ponies above 13 hands formed another superior class, and the Judges will be found estimating very highly the claims of the winners. The Duke of Hamilton's "Bosco" displays beauty all over, in head and neck, shapely form, and nice glossy skin; and Mr. Cockle's "Kingfisher" is very like to him in colour, character, and appearance. The third winner had less style, but sterling merits, in a frame strongly built and compactly put together. The smaller ponies in Class 39 were four only, all very pretty, and well adapted to be pets for the nursery.

The harness classes brought some capital animals into view, one of the best of which was Mr. Statter's far-famed "Speculation," which is generally admired for splendid action, and has carried off many prizes. While she was quite the Queen of the harness hacks and cobs, more than one harness pony created quite as great a sensation by superior action in the ring. Mrs. Henry Frisby's "King Polo" raised repeated plaudits from spectators, who were fairly enraptured each time he was driven round before them at Aston Park. But the Judges appreciated him equally highly, and it will be seen that they term him "a wonderful animal." Mr. Mitchell's "Lady Isabel," the second prize in the same class, showed also good action and great spirit, and to a large extent shared this approbation. "Belle of the Ball," belonging to Mr. Joseph Allkins, is a little gem, sweetly moulded in form, and displayed beautifully in harness likewise. She has brought to her owner more than a dozen first prizes, and will probably win many more. It will be seen that the Judges, in remarking on her performance, call attention to the fact of her being only 11 hands 2 inches high. They report on hacks, roadsters, and ponies, as follows:—

Class 9.—This was not a well-filled class. The prize-horses were of fair average merit, but, as a rule, rather deficient in quality.

Class 10.—There was no particular merit except in No. 1 prize, who won easily.

Class 23.—The prize animals in this class were very meritorious.

Class 24.—This class was not well filled, but great merit was shown in the animals exhibited.

Class 34.—The horses exhibited in this class were of a very mixed character.

Class 35.—A small entry in this class, but the prize-winners very good indeed.

Class 36.—This class was very well represented as a weight-carrying class. The first prize is a tower of strength, of striking character, and with good riding action. The same may be said of the second-prize cob.

Class 37.—This class does not require any special mention.

Class 38.—A very good class indeed. The prize-winners were, without exception, of excellent merit.

Class 39.—No special report is required.

Class 40.—The first-prize winner in this class is a wonderful performer, of great merit, and well known in the Showyards.

Class 41.—No report.

Class 42.—The first-prize winner in this class is a wonderful animal, with very fine action, great speed, and full of quality and good looks. The second-prize animal also showed very good action with speed.

Class 43.—The first-prize animal was an extraordinary one, with very fine action and quality, and only 11 hands 2 inches.

H. Beevor.
Hon. G. E. Lascelles.
W. Parker.

Cattle.

With an extensive array of Shorthorn cattle, joined to less numerous but very superior collections of Herefords and Devons, there was such a display of the old Longhorned breed as has never before been witnessed. This formed quite a special feature, and the Birmingham Show will hereafter be regarded as commencing a new epoch for the breed. The Jersey cattle were also far more numerous, lovelier in appearance, and more meritorious than they have ever been at a Royal Show on any previous occasion; while the cherry-red cattle of Sussex furnished sufficiently admirable specimens to prove their good qualities for beef-making, and the wonderful refinement in bone and symmetry they have undergone in recent years. A capital representation of the bovine breeds was, therefore, exhibited.

"Class 44 we consider very good," is the laconic report of the Judges on the Shorthorn old bulls, which were brought under their inspection to the number of fourteen, no less than eight of whom they retained for a very close and lengthy scrutiny before making their award. Such a collection of grand forms, with shapely limbs and majestic carriage, formed a rich repast for the eyes of Shorthorn breeders. There was "Telemachus 6th," the prize-winner, fresh and blooming, who has carried everything before him this year, and who, in his good head, level back, broad front, style of moving, and neat character, seems to grow more and more like the grand old bull, his sire, the victor of so many fields. But very close up to him came "Sir Arthur Ingram," the second bull, who at the Hull Show carried off the Society's first prize for yearlings, and a first at Bedford as a two-year-old. The Earl of Shrewsbury's "Hindoo Chief," with his beautiful crest, capital loin and back, and showy style, seemed imposing in appearance, and secured third honours; while "Serjeant Irwin," who owns the same sire as the second-prize bull, and "Robert Stephenson," were placed next. The latter has followed close on "Sir Arthur Ingram's" heels throughout his career, having been second to his first at Hull and Bedford, and third to his second at Taunton. These formed the *crême de la crême* selected for honours; but of what remained an admirable class might have been formed.

The two-year-old bulls were not deemed by the Judges so meritorious a collection, in which opinion the public will probably coincide; but there were two or three beautiful young animals in the class. Mr. A. H. Brown's "Pioneer," who took first prize last year, when his sire, "Duke of Aosta," also won a chief honour, was properly allowed to head them, and is likely to be a Showyard favourite for some years to come, having a very sweet head and being faultless in form. The Marquis of Exeter's "Telemachus 9th" was placed next him, of whom it may be remarked that he displays some resemblance in neatness and general character to that celebrated sire who seems to have impressed his own good qualities very powerfully on all his offspring. Mr. Foljambe's "Sweet Pea," the remaining prize-animal, handles well, and possesses some style.

The yearling bulls formed a round dozen, and will be found well approved in respect of merit by the Judges, who were compelled to spend some considerable time in placing them properly, several being possessed of nearly equal claims. Both Mr. Bland's "General Fusee" and the Duke of Northumberland's "Snowstorm," which won first and second prizes, are broad and level over the back, and young animals of high promise; and Mr. B. St. John Ackers's "Clovis" has so steadily improved since his appearance, that he is likely to develop into admirable contour on the completion of his growth. Mr. Rowley's "Count Towneley" made a good fourth; and Mr. Wright's "Beacon," who was "highly commended" and received the Reserve Number, probably owns the best middle of any animal in the class.

Whites were in the ascendant in the bull-calf class. Mr. Torr's "Fitzwilliam," who was declared to be the best, and the Duke of Northumberland's "Cheveley," who took third prize, being of that colour. The Judges remark, that while it was a fair class, some of the animals were "very good." They selected eight from a lot about twice as large again, and the placing required much deliberation and attentive survey. The whites alluded to were both rather small, but remarkably neat, with very little to find fault with in the shape or quality of either. The second animal, Mr. Nevett's roan, called "Claro's Duke," is a beauty of another stamp, with grand back and quarters, and an altogether large frame and dashing style. The Judges also took notice of Mr. B. St. John Ackers's handsome young bull, "Prince of Georgia," and Mr. G. Garne's "Viscount Cherry," who, although small, is so comely and well shaped, that he will be hard to beat if all goes well another year.

Shorthorn cows were few in number, but the Rev. R. B. Kennard's beautiful "Queen Mary" was there to head them; and some will have it that her fame and the anticipation of her presence kept not a few others away. Lovely as a heifer, and now perfectly majestic at four years old, she has been held up to the world as a model Shorthorn, whose almost perfect contour and prepossessing charms have seldom or never been equalled. The present generation knows little, except by reputation, of those beauties which so dazzled the eyes of breeders when "Necklace" and "Bracelet" were famous Show-cows, and Mr. Bates brought "Duchess 34th" to a Royal Showyard to meet and conquer the former. Indeed, many people have almost forgotten Mr. Richard Booth's celebrities of a later period, when he swept off Showyard prizes wholesale. His "Queen of the Vale" and "Queen Mab" were so faultless, it is said, that even "old Cuddy," the herdsman, never knew which to prefer. Even "Charity," according to Carr, was "the personification of all that is beautiful in Shorthorn shape;" while he relates of "Queen of the May" that "two American gentlemen were perfectly ravished by the fascination of her beauty." It is not too much to assume that some of these, and several others which could be named, were of equal merit, if not superior, to "Queen Mary;" but certain it is that no Shorthorn cow in recent years has been brought to the Showyard which has carried off more trophies or been half as much admired. Her easy victory at Birmingham gave her owner the fourth Royal first prize she has won since entering the lists as a calf at Hull. Her achievements include more than a dozen other leading prizes, besides two 100 guinea challenge cups, namely, the Gloucestershire, furnished by Mr. B. St. John Ackers, and the Havering

Park, given by Mr. McIntosh. These she has won now three years in succession, and they can no longer be wrested out of the Rev. R. B. Kennard's hands. If there were more "Queen Maries," it is to be presumed challenge-cups would get very scarce indeed; but her Showyard career has now terminated, and all lovers of Shorthorns will readily join in the hope that she may excel in fertility of breeding, so that the Marnhull herd may be enriched with daughters from so superb a dam, and as beautiful as herself. Her two half-sisters, "Blossom 2nd" and "Olga," who won first and second prizes in the two-year-old heifer class, are deemed almost her equal now, and have run a splendid career of success with her throughout the present season. At one or two Shows the white has been preferred to the roan; but the verdict of the Royal seems the right one, and has been endorsed in the greater number of cases. "Olga" is much the finer heifer of the two, and possesses a truly grand frame; but "Blossom 2nd" excels in neatness, quality, and comely shape, promising to develop into a cow not at all unlikely to take "Queen Mary's" place and retain it.

This two-year-old female class was termed by the Judges "the best in our department." It included a large number, and they were sufficiently meritorious to have furnished a second set of good prize-takers in addition to the splendid quartette favoured by the Judges. Lady Pigot's "Flatterer," the third-prize heifer, seems a wealthy good animal, although not quite faultless; and well-nigh the same description would serve for Mr. Lamb's "Laurestina 3rd." Sir G. W. Armstrong's "3rd Oxford's Welfare," who took the Reserve, being sweet and pretty-styled; and a still more showy animal, whom the Judges "highly commended," Mr. Hutton's "Melpomene 3rd" having high merit; neither they nor the commended heifers, Mr. T. H. Miller's "Ringlet 5th" and Mr. O. Viveash's "Numidia," would have been unworthy of prizes had those placed before them by the Judges been absent.

With eight such heifers in a class, no wonder the Judges appreciated it so highly; but the yearling heifers were not far behind the others in merit, and were brought to the ring in greater numbers. Two admirably shaped, lovely animals, came in front. Both seemed very good, and when they appeared in the ring outsiders were well-nigh equally divided in weighing their respective claims. These were Lady Pigot's "Imperious Queen" and Mr. McIntosh's "Charmer 24th." The Judges decided the knotty point by placing them in the order just mentioned, by which the latter holds the same position which was awarded her as a calf at Taunton, while the former rises from being third to the chief position. But probably no animal has improved so much in a single year as this charming yearling of high promise. The third premium was awarded to "Iole," from the Marnhull herd, another half-sister to "Queen Mary;" all four prize-winners being by that rare old sire, "Grand Duke of Oxford." "Iole" is not quite the equal of the other three, but appears likely to develop into grand form, and may possibly improve in position another year. Mr. Griffin's "Blushing Rose" shows most luxuriant growth, and is a remarkably fine animal for her age. The Mytton Farming Company's "Ruby 6th" and Mr. Statter's "Lady Beautiful" are both handsome in appearance, and thoroughly deserved the honourable mention the Judges gave them. From the Judges' Report it will be seen that they disqualified one of the best of the yearlings, because they found her injured from over-feeding. There can be no doubt this was very wisely done, and those who found fault at the time will learn at length the reason this favourite, whom they backed for a prize, was not even mentioned. This should be a lesson to those who are nothing loath to dispute the decisions of Judges. Outsiders, however gifted and experienced, have seldom the opportunity of forming as correct an opinion as those appointed to the task, and this discountenance to overfeeding cannot be too strongly commended.

The heifer-calves were almost as numerous as the yearlings, and by no means wanting in merit. The prize-winners, at least, were three superb beauties, of whom we may expect to hear again; one of Mr. Coleman's "Golden Duchesses," now owned by Mr. C. A. Barnes, being first, Lady Pigot's "Dainty Dame" second, and one of Lord Dunmore's "Red Roses" third. The Judges showed their appreciation of the class by giving a high commendation to the pretty calf of Messrs. Hosken and Son, called "Miss Ada 8th Twin;" and commending Lady Pigot's "Victoria Benedicta,"—which seems almost equal in style and quality to "Dainty Dame," and is likely enough to leave her in the van another year; also Mr. G. Garne's "Princess of Geneva" and Mr. Statter's "Lady Gertrude," both of rare quality and hopeful promise.

The following is the Report of the Shorthorn Judges:—

CLASS 44. We consider very good.
CLASS 45. Inferior to the former.
CLASS 46. A very fair good class.
CLASS 47. Also a fair class; some of the animals very good.
CLASS 48. A small, but meritorious class.
CLASS 49. The best class in our department.
CLASS 50. We also considered very good, and take this opportunity of stating that one of the best heifers shown in this class is very much injured by overfeeding, and consequently not placed.
CLASS 51. A very fair class.

GEORGE DREWRY.
RICHARD CHALONER.
A. MITCHELL.

Herefords were in tolerable force, and as might reasonably have been expected, considering that their native feeding-grounds were not very remote, the greater part of those exhibited were admirable specimens of the breed—animals superior in form, thickly coated with wealthy flesh, and displaying all the characteristics of beef-making. The old bull class brought to the ring several noted prize-takers, and amongst them Mr. Taylor's "Tredegar," who has seldom been surpassed for wealth of flesh, capital brisket, and lengthy quarters. He possesses, too, a fine head and majestic style, and looking at him, no one can feel surprise at the long list of his conquests in many fields. But for the bone being a little too near the surface over the crops, this animal would be well-nigh faultless. Mr. Warren Evans's "Von Moltke 2nd," who was placed next to "Tredegar," is marvellous in development behind his shoulders, girthing there 9 feet 2 inches. He is also good in back and loins, and with a magnificent frame displays a capital front. He won first prize at Bedford, but was only placed third at Taunton last year, when he was a little amiss. He seems very thick in flesh and blooming now. "Baron 4th," a smaller bull, of excellent quality and nice elastic touch, made a good third; and in the Reserve bull, "Gilder," belonging to Mr. Richards, the wealthy characteristics of this breed in producing immense bulk and substance were again displayed. This animal was coated with a truly marvellous mass of flesh. The fact that all four animals receiving honours in this class trace to the celebrated bull "Frankey," whose impression was so marked and powerful, is well worthy of observation. The two-year-olds mustered few in number, and with nothing very superior in quality, except perhaps Mr. Thomas's "Horace 2nd," who is grand round the heart region, displaying a magnificent chest. He is also bulky in frame, with good quarters, but seems a little paunchy, which deprives him of that symmetrical appearance his frame would otherwise display. The second bull, Mr. Davy's "Lord Compton," has, at least, nice quality, and his shoulders are well set. He retains the same position in the prize-list he held at Taunton. The yearlings were more numerous, and formed an admirable collection. From the Showle Court herd came two—"Thoughtful" and "Taunton." The former is symmetrically built, with good quarters, and only wants the fine character of "Tredegar" to be well-nigh perfect. He was accorded the place of honour. The latter received the first Royal prize as a calf, and derives name from the town where he was honoured. He now took third prize; while Mrs. Edwards's "Sir Edward," by "Winter de Cote," a handsome animal of nice style, who on one or two previous occasions has beaten

"Thoughtful" when they have met, received second prize. A good calf-class of any breed imparts hope for the future, and the bull-calves at Birmingham were certainly a superb collection. They were headed by a good-looking son of "Tredegar," from the Showle Court herd, called "Telescope;" the second was Mr. Carwardine's "Ben Battle," a promising fellow; and the Judges gave commendations to three others.

The cows were very select, a few of the choicest herds offering their best specimens. The Adforton "Rosebud," not for the first time, takes precedence over the Glamorganshire "Rosaline," who, after winning her first Royal prize at Cardiff, has had a most successful Show career. Both are handsome, and the class must always be a good representative one when they stand first and second; but the Showle Court and Whitfield herds played their trumps also, and "Hazel 3rd" came third, with "Satin," the Hereford second winner, to take Reserve Number. By common consent Mr. Carwardine's beautiful "Helena" has ranked first throughout the season as the best Hereford heifer of the day. She captivates amazingly on inspection, her almost faultless symmetry satisfying the eye: and being mellow and downy-coated to touch, as well as fascinating to look at, "Helena" is a perfect gem. Her Majesty the Queen had two very prime heifers in the class, to one of which was awarded third prize. All outcomes from the Royal Hereford herd seem to have a like character. Those who know say that this is attributable to the impress of the bull "Maximus." The second winner was "Lady Blanche," from Mr. Warren Evans's herd. She is rapidly developing into superior form, and has made astonishing progress since last year. The second yearling at Taunton, namely, Mr. Taylor's "Cherry," was exhibited, but remained unnoticed, and there appears to be a sufficient cause, which cannot be too widely known. This heifer was cut up so badly with foot-and-mouth disease last autumn that she had not fully recovered from the effects of the attack. The first and second calves at Taunton occupied the same positions as yearlings this year; Mrs. Edwards's "Mabel" having the post of honour, and Mr. W. Burchell Peren's "Lady Lottie" second place. Both are lovely heifers, and the sweet character of the latter might give her preference over the former, but for rather gaudy rumps. Mr. Turner's "Mulberry," which was put first at Hereford, came in third here. She has been a little amiss recently, but being well built and a yearling of promise, may prove a formidable competitor next year. Mrs. Edwards won both prizes in the calf-class with two of the sweetest outcomes of red and white ever derived from the Wintercott or any other herd. The names of these beauties are "Leonora" and "Beatrice." Both are by that grand sire "Winter de Cote," and no doubt derive much of their high quality and beautiful contour from that first-class bull. This class of heifer-calves was altogether a large and superior one, not a few of the leading herds being represented.

The Judges make the following remarks on the Herefords:—

> The Herefords exhibited at Birmingham were, on the whole, very good. There were a few inferior animals, but there were many of first-rate quality—their equals are not often to be met with.
>
> Class 52.—The first-prize beast in the class is a splendid animal: a finer specimen of the breed is rarely to be seen. The second winner is a good animal, of excellent quality and great scale.
>
> Class 53.—This is a very weak class. The first-prize animal is a very good, masculine beast.
>
> Class 54.—This class contained a few useful animals; the Reserve Number, 594, running the third winner a close race.
>
> Class 55.—A large class, and we considered them not up to the usual standard.
>
> Class 56.—Very select, and four of the five animals exhibited are really good examples of the Hereford breed.
>
> Class 57.—The first and second winners are magnificent animals. This was an exceedingly good class altogether.
>
> Class 58.—A very good class.
>
> Class 59.—First and second winners are grand specimens, and will no doubt be seen and heard of again in the Showyard. Several other animals in this class possess considerable merit.
>
> The site selected for the ring was not satisfactory to many of the exhibitors, as (independent of its unevenness) it was too isolated for the exhibition of one of the old established breeds of the county.
>
> Thomas Fenn.
> George Baker.

The Western reds were less numerous than the white-faces, which was of course attributable to the greater distance they were from home. Their representation, however, lost nothing in character, owing to the very choice specimens which were produced. Devons must excel in quality, or they are nothing; but those brought before the eyes of the public in Aston Park were so faultless in symmetry, that not a few connoisseurs deemed them the very cream of the bovine display. The old bull class had only five entries, but every animal received notice from the Judges. "Master Robin," the far-famed Stowey Court bull, well merited the pride of place which he obtained. He has won first prizes at the Royal every year since he was a calf, and wins them everywhere, his herdsman boasting of a long list, including fourteen or fifteen. His form presents a beautiful model, such as the true artistic eye may rest on with delight; and not on his only, but on the shapely exteriors and exquisite features of two or three of his fellows standing side by side; for Mr. Gould's "Tempter" and Lord Falmouth's "Kingcraft" seemed equally attractive in appearance, and only the critical eye could discriminate between their respective merits and those of the chief winner. But it will be seen by the Judges' Report that they regarded with still greater approbation Classes 61 and 62, containing the two-year-old and yearling bulls. Lord Falmouth's splendid quartette in these lots, two of whom secured first and second prize in the former, and the others second and Reserve in the latter, were all neatly modelled and of rare quality. Another choice animal was Mr. W. Farthing's first-prize "Master James," who would be almost faultless if a little better shaped behind—a remark almost equally applicable to Mrs. Langdon's "Duke of Flitton 12th," a bull of exceedingly nice character and pleasing style. Amongst the bull-calves was one very promising and meritorious, exhibited by Her Majesty, to whom the Reserve and a high commendation were given. Mr. Farthing's calves took the prizes, thereby conquering Mrs. Langdon's "Duke of Flitton 13th," who had previously beaten them at Tiverton and Hereford. This class, too, was undoubtedly remarkably good.

Quite an *embarras de richesse* presented itself with the cows, who were the pink of perfection, such as would scarcely be matched again, taking the entire West country through. First came Mr. Farthing's "Pretty Face," with grand shoulders, middle, and flank, and a sweetly modelled form almost resembling that of a Leicester sheep. Second to her was placed Mrs. Langdon's beautiful "Actress 2nd," which well displayed the North Devon quality. Mr. W. Perry had two beautiful cows, "Dairy Maid" and "Camellia," both of which have often conquered in Western fields; and the splendid collection also comprehended Mr. Trevor Lee Senior's "Moss Rose 1st," Sir Alexander A. Hood's "Lovely," and a very thick, compact, wealthy young cow, belonging to Major Buller, all of whom received notice from the Judges.

Her Majesty the Queen won second and third prizes in the two-year-old heifer class with two beauties, "Florence" and "Alice;" the latter very pretty and possessing sweet style, but the former having the most charming model, with a prominent feature in delicately-tapering waxy horns. But there was a better in the class than either in Mrs. Langdon's really superb "Actress 8th," who excels very much in form and quality. The prize-animals in the yearling heifer class, belonging to Mr. Farthing, Mr. George Turner, and Major Buller, were rarities in refined quality and admirable contour, on which any artistic Devonian eye might feast. But in the highly commended "Picotee 1st," and the commended "Miss Boscawen" and "Miss Ethel"—belonging to Mr. Trevor Lee Senior, Mr. W. Smith, and Sir A. Hood—there would have been a good representation to give credit to the class had the prize-winners been absent.

The heifer-calves were probably of higher merit still, and Mr. Farthing, as in the previous class, came to the front with a beautiful specimen, having lovely head and shoulders, very sweet character, and, with the exception of being a little faulty behind, of shapely form. But, regarding perfect symmetry alone, Lord Portman's "Ladybird," the second calf, had probably no superior. This was a beauty cast in an almost faultless mould, who, but for her too light colour, would have seemed perfection. There was also an elegant little "Temptress," whose comely looks and sweet touch proclaimed a likely prize-winner of the future; and Major Buller exhibited one to take the Reserve, which seemed far above average merit. The class was a thoroughly good one, and all the other animals not alluded to, numbering five, received commendations.

Reporting on the Devon classes, the Judges say:—

> We briefly state, that although the classes were not so numerously represented as might have been desired, yet in each class there were specimens possessing more than ordinary merit, which may be regarded with favour by their respective owners, more especially referring to the Male Classes 61 and 62, and the Female Class 64, not forgetting the babies in both classes.
>
> SAMUEL P. NEWBURY.
> JAMES TREMAINE.
> HENRY OVERMAN.

A prominent feature of the Birmingham Show was the grand display made by Jersey cattle, which now come to the Showyard every successive year in increasing numbers, and with a marked and striking improvement in quality. The Judges have referred to this matter very prominently in the Report appended, and have so minutely entered into the respective merits of the various classes and animals, that I need scarcely go in detail over the ground which has been traversed by them so well. The remark may be made, however, that the prize and reserve bulls, "Madman," "Silver Prince," "Steel," and "Prince Charlie," in the older class, and "Luton Hoo," "Mohawk," "Nobleman," and "Fanfaron," in the younger, all seemed fashioned after a different and far more symmetrical model than the male animals of the breed which were brought to the Showyard ten years since. This fact strikes the reflective observer quite as much as the large number of entries in the two classes—thirteen in one, and seventeen in the other.

But the cow and heifer classes were far larger, and still more striking. In making their awards, Judges look to colourings of the skin, and other points which indicate good milking qualities, rather than to comely forms, and those charming features which attract the fancy: to which fact may be attributed the inability of the public frequently to understand their decisions. In the present instance very good reasons are afforded in the Report why certain animals were preferred before others. Probably it is only by being thus communicative that Judges can avoid being misunderstood. On the whole, the Jersey decisions at Birmingham were admirably well received, and very slightly canvassed; but the explanations so fully accorded will not be the less welcome, as they will tend to educate the public on the principles which should be observed in forming a proper estimate of Jersey cattle.

The cows and heifers whom the Judges delighted to honour were mostly old favourites. In the older class Mr. Simpson's "Pretty Maid," Mr. Tower's "Victoria," and Mr. Digby's "Julia," who received prizes in the order named, are well-known Show animals. With Lord Chesham's "Dora," who took Reserve, the public are less familiar, although her beautiful form made a grand impression at this Show. The commended cows were Mr. Ramsden's "Rose" and Mr. Simpson's "Queen." The latter has generally been placed above her companion "Pretty-maid," but, owing to being in season on the morning of exhibition, her udder was not so full as usual, and she was scarcely in condition for show.

Considering the magnitude of the heifer class, the discrimination displayed by the Judges was truly marvellous. The five which they separated from the bulk as the *crême de la crême*, seemed paragons of loveliness and rare quality, such as are seldom seen. They were "Lemon Peel 2nd" and "Luna," belonging to Mr. Simpson; Mr. Dixon's "Brunette" and "Grisette;" and the Rev. Morton Shaw's "Lilac." The latter appeared to outsiders the worst of the lot, but she received third prize, and a reason for her being so well placed appears in the Report. The chief prize-taker was the first-named, and the second "Brunette," the other two receiving high commendations. But Mr. Miller's "Butterfly," Mr. De Vitré's "Spot," and Mrs. Leigh's "Beauty," were commended.

The Guernsey classes formed a singular contrast to the Jersey in being so small. Some may be inclined to conclude from the circumstance that the one breed is not so much cultivated in England as the other. Both, however, are popular, only the former does not always get into the hands of people accustomed to Shows. The Guernsey has always been considered the cottager's cow, but the Jersey inhabits the parks of our nobility, and the suburban retreats of wealthy citizens. Usually the most docile of the bovine species, it is a melancholy incident connected with the Show that Mr. Baker's prize-bull, "Johnnie," who used to follow his keeper about as a child, grew vicious after his return from Birmingham, attacked and killed the faithful man in charge, and had to be shot himself. The Report above alluded to is as follows:—

JERSEY CLASSES.

In reporting upon the classes submitted to our consideration and judgment, we cannot fail to draw attention to the great increase which has this year taken place in the entries for competition.

In CLASS 68—*Bulls above Two Years old*—twelve animals competed. This was an even class, with none so striking as to stamp him at once as far superior to the rest. No. 716, an animal of good quality and form, to which the first prize was awarded, might, owing to his colour, have been suspiciously regarded as showing a strain of Guernsey blood, but there were features about him altogether typical of the Jersey breed which unmistakably set aside the idea, and it was not without satisfaction that the Judges were informed, after their opinion had been expressed, that, although many believed the animal was not pure-bred, it had been most creditably ascertained that he was so. This fact shows that persons who follow up the breeds of the Jersey and of the Guernsey cattle should study closely their distinctive features. It is an error to suppose that the light-red coloured bull is not met with in the Jersey cattle; although not very commonly, still he is occasionally found, as in this case, not unfrequently with the black tongue and tail. The second prize was awarded to No. 705, an aged, showy, and stately animal, but which might have carried a better head. No 710, a dark-coloured bull, with a well-knit frame, but too heavy about the head and neck, took the third place, and the reserve was given to No. 709, an animal of promise, showing unmistakable evidence of good blood.

CLASS 69—*Bulls above One Year and not exceeding Two*—was a stronger and better class than the former. In this there were seventeen entries. The first prize was adjudged to No. 727, very near the limit of the prescribed age for this class, being only a few days short of two years old. This animal, stout, squarely set, and highly bred, possesses very considerable merit. The second prize was carried by No. 720, with a neat head, and generally good type; and No. 718, also a good and well-bred bull, but very closely contested by No. 723, obtained the third prize, the reserve number and high commendation being given to the latter. No. 729, also a good animal, was commended.

CLASS 70. *Cows above Three Years old.*—This, as a whole, was a very satisfactory class. No. 747, a rather small but highly-bred cow, took the first prize. Her particular distinction was richness of quality, and she looked the milker all over. She claims a plainish head, but an excellent udder. For position she was very hard pressed by No. 738, which took the second prize, and also showed excellently. No. 740, the next prize-taker, very handsomely shaped, and probably a large milker, lacks that yellowness about the ears and elsewhere, which denotes a corresponding richness of produce; whereas No. 736 the reserve and highly commended number, though not nearly so handsomely framed as the former, is very meritorious for quality. The same remarks may also be made with reference to the commended animals, Nos. 735 and 745. In reference to No. 744, it must be observed that in many respects this was one of the best animals in the class; but one quarter of her udder having lost its yielding powers, she was deprived of a position which she would otherwise have held. It must also be observed in reference to this class, that some of the animals were shown in the ring very disadvantageously, inasmuch as their udders, being unduly distended, were consequently distorted, through having been kept too long without milking prior to their examination. It is well to show the capacity of the udder, that its form may be seen, that the partial or the non-producing quarters may be the more easily detected. But it becomes injurious to carry this beyond the attainment of those objects. It would be well if on this point some regulation were established for the future.

Class 71. *Heifers in-Milk or in-Calf not exceeding Three Years old.*—The entries in this class were, without exception, more numerous than in any other of the cattle-classes exhibited at this meeting. No less than thirty-three animals were entered; and when it is considered that these specimens, varying from 16 months to 2 years and 7 months of age, were competing against each other, it will be easy to understand that a certain degree of difficulty exists in determining how the prizes are to be awarded. In this case a young heifer, twelve months old, without development of udder, might be brought before the Judges by the side of a powerful three-year-old in full milk, which might, indeed, have given birth to two calves, and have no good claim to the distinction of heifer. How, then, in fairness to the merits of each, can they compete in the same class? For this reason, therefore, and in consideration of the position which this class has attained numerically, the Judges deem it their duty to point out for the consideration of the Council, the advisability of dividing for the future the heretofore existing Heifer Class into two distinct classes, viz., heifers in-milk or in-calf above two years, and not exceeding three years old; heifers above one year, and not exceeding two years old.

Returning to the animals exhibited and the awards given, the first prize was taken by No. 776, a heifer in-milk, generally good all round; and the second prize by a heifer in-calf, No. 754, of good quality. The third prize came to No. 770. This heifer has a long and plainish head, but this is more than made up by the excellent form of her udder. No. 754, to which was given the Reserve Number, was small but neat. Here was also an instance where undue distension through delay in milking produced an unfavourable appearance in the position of the teats. No. 774, highly commended, and Nos. 749, 761, 766, commended, deserved this distinction as good and serviceable animals.

Guernsey Classes.

These classes were unusually short in their entries, which is to be regretted the more as the dairy properties of the breed recommend themselves highly to the consideration of amateurs and dairymen, both in respect to quantity and quality of produce.

Class 72. *Bulls above One Year old.*—In this four animals competed, and the prizes were awarded as follows:—

To No. 783, good all round, the first place was easily attainable. The second was given to No. 782, which was closely followed by No. 781, the Reserve Number and Highly Commended.

Class 73. *Cows above Three Years old.*—In this class there were only three entries. No. 786, with a good head and frame, though not quite perfect as to the position of her teats, obtained the first prize, and No. 785, the second, the Reserve Number being 787.

Class 74. *Heifers in-Milk or in-Calf not exceeding Three Years old.*—The prize in this class was awarded to a good animal, No. 789. The Reserve Number, 788, was only ordinary.

James Dumbrell.
Charles P. Le Cornu.

The wealthy and robust Sussex cattle did not appear in great force, but the representation of the breed was complete as regards its claims to be one of the best beef-making sorts in the kingdom. Mr. Turville's "Tom," the first of the old bulls, has immense substance, nor is he deficient in quality. Messrs. Stanford's

"Dorchester," who comes next him, owns a compact well-built frame. Both are old Showyard beasts, the latter deriving name from the town where he took his first prize. The breed will be sure to gain reputation from the exhibition of such animals, thick in flesh, and covering grand frames. Mr. Turville may not only be proud of "Tom," but of two excellent young bulls in the next class, bred by him, although now owned and exhibited by others. These are Mr. H. H. Hammond's "Hartley 1st," who possesses levelness at top, symmetrical shape, and nice character; and Mr. Braby's stoutly framed, wealthy "Headley." To the first the leading position was assigned, and the latter was highly commended. Mr. Whitehead's "May Duke," who took second prize, is also a shapely, good animal. The yearling bulls were a very sweet lot, Mr. G. Smith's "Young Hartley" displaying a style and quality which made him adorn first place very creditably, while the nice character of Messrs. Heasman's "Croydon" represented effectively the high breeding of the Angmering herd.

A beautiful collection of well-shaped, hardy, and remarkably good-looking Sussex cows—the picked celebrities of several of the best herds—proved to what a high stage of improvement the breed has been brought, for, in the old days, it used to be remarked that, although the South countrymen brought out the best-weighted and finest oxen in Smithfield, the cows they bred them from were not worth looking at. This is, indeed, changed, for the entire class of cows in the present instance received commendation from the Judges. There were two or three noted Showyard favourites besides Mr. Child's "Jewel" and Messrs. Stanford's "Dorset" who received the prizes. Mr. Agate's "Auburn," who took the reserve, has been highly distinguished as such; and the same may be said of Messrs. Heasman's "Cherry" and "Pride of Ham." In fact, "Auburn" received first prize at Bedford. Two beautiful heifers were selected for the prizes in the two-year-old heifer class, namely, Mr. Agate's "Honesty 1st," and Messrs. Stanford's "Rosedew." In a pretty yearling class Mr. Blake Duke's "Young Barmaid" won great admiration for her sweet head and pleasing contour of form; but in the estimation of the Judges one still better was found in Messrs. Stanford's "Rosedew 2nd," who, it must be admitted, is an admirable specimen of the wealth and good qualities the breed can be now made to display. In reporting on these classes the Judges briefly observe:—

> We regret the competition was no greater; nevertheless, the marked improvement, both in form and quality of flesh, is such as fairly entitles the Sussex to be regarded as a most distinctive and useful breed of cattle.
>
> S. P. Newbury.
> J. Tremaine.
> H. Overman.

A leading feature was the large display of Longhorn cattle, which had never on any previous occasion presented anything like such an imposing muster. Very interesting and attractive they appeared, with their long curling horns and handsomely marked colours. But, however pleasing to look at, it is by no means certain that they are a sort desirable to own for grazing purposes. The handling of not a few in Aston Park was extremely indifferent, a thickness of hide responding to touch but little understood by those whose experience lies among Shorthorn, Devon, and Hereford cattle. This was not so in the case of all, the Duke of Buckingham's animals, with the "Conqueror" blood, in particular displaying much more softness and elasticity. No doubt the modern revival of this old-established breed will lead to a great improvement in this respect; for in these days of beef-making no sort of animals can be expected to extend themselves unless they possess thoroughly wealthy characteristics. A leathery skin is not unfrequently a concomitant of the brindle colour, and animals possessed of both are often to be found in dairy-districts displaying good milking properties; but experienced graziers would much prefer to have nothing to do with them.

The fact that more than sixty animals of the breed were brought together at Aston Park, and that they were from more than a dozen herds distributed all over the Midlands, and as far westward as Somerset, shows that the revival movement has taken a good hold on the country. The old bull class had nine entries, with the Duke of Buckingham's "Conqueror 3rd" to lead them. He seemed by far the best, and one of his sons, "The Marquis," conquered in the yearling bull class. Some of the other bulls were handsome, and somewhat grandly shaped, but very few handled at all kindly. The cows looked milkers all over, and no doubt the good dairy properties of the breed, combined with great hardihood, is what recommends it so much in the Midland Counties. Mr. Forrest's "Lady" and "Bluebell," both bred by Mr. J. H. Burberry, of Kenilworth, were considered by the Judges the best specimens of the breed in the class, and certainly they were good-looking ones. Three or four of the others varied much in type and general character. In the three-year-old heifer class two daughters of the first-prize old bull from the Duke of Buckingham's herd, "Lady Twycross" and "Barmaid," took first and second prizes. They possessed the same kindly touch as their sire. It will be seen by the Judges' Report that this class in particular impressed itself on their notice as a good one. Besides the animals mentioned, Mr. Tomlinson had a couple of nice-looking ones—"Lady Weston" and "Loophorn 4th"—which received third prize and reserve. The two-year-old class was strong in numbers, but scarcely so deserving as regards the high quality of the animals. The Duke of Buckingham took another first prize with a third daughter of "Conqueror 3rd," namely, "Countess of Temple," who, like her half-sisters, displays the same nice character as their valuable sire. The Longhorn and dairy cattle came to the same ring, and were judged by the same Judges, who state in their Report:

> We found the classes well represented, especially the aged bulls; and the three-year-old heifers were very good. The dairy-cows were also useful, and the young stock very promising.
>
> James Somerville.
> Benjamin Walker.
> Mathew Hewertson.

The dairy-cows were in two classes, one consisting of pairs from the same herd, and the other of single cows. The competition seemed of a most interesting nature as milkers of various breeds competed. The Shorthorn, Longhorn, and Ayrshire breeds, had two pairs each to represent them in their own class with a single pair of cross-bred cows, called "Yorkshires." The first and second prizes went to the Shorthorns, who were beautiful cows, with very capacious udders. The third prize and reserve were taken by the Ayrshires. This result, it will be seen, does not at all tend to advance the Longhorn cattle even as milkers, in which character they might have been expected to succeed best. Neither did they take any honours in the class for single cows, where four of the breed were entered with the same number of pure Shorthorns, two Ayrshires, two cross-breds, and one Yorkshire cow; for the first prize was given to Mr. Wodehouse's "Countess," a roan Shorthorn; the second to Mr. Cogswell's Cheshire roan; the third to the Yorkshire cow exhibited by Mr. T. Statter; and the reserve, with a commendation, to Mr. Kingsley, for another Shorthorn, namely, old "Seraphina 1st."

SHEEP.

Sheep came out nobly in the grand display, and particularly those modern kinds which have the reputation of being farmers' rent-paying animals, on account of their bountiful and rapid returns of mutton, combined with large yields of wool. Of these the Lincolnshire Long-woolled, and the Shropshire and Oxfordshire Downs, were not only more than commonly numerous, but they contained such superior specimens as to give the sheep-pens an unusual attraction. As Southdowns, too, were in force, with a splendid array of animals possessing nice character and fine quality, the Society may be congratulated on having brought together an exhibition of the woolly tribes of well-nigh unexampled merit.

In referring to the Leicesters the Judges report:—

> We found all classes well represented. The shearling rams were mostly good, and, as a whole, a fine lot of sheep. The aged rams were, with few exceptions, a superior lot. The shearling ewes varied somewhat in size and character.
>
> FRANCIS SPENCER.
> CHARLES WM. TINDALL.

The best shearling ram was from the flock of one of the oldest of the Society's exhibitors, Mr. George Turner, of Brampford Speke, who, just to show what the "old folk" still can do, conquered his son, the noted prize-taker for this breed, with a remarkably fine and magnificent sheep, whose only fault is a want of fulness in the leg of mutton. Mr. Turner, of Thorpelands, however, came in second and third with beautiful shearlings of sweet character; and the reserve was given to Mr. W. Brown's very good ram from his Yorkshire flock, which seemed better woolled than either. The shearling class was admirably well filled, but, as regards superior merit, the older rams must be preferred, although fewer in number. Here Mr. Turner, jun., came to the front with a well-nigh perfect specimen of the Thorpelands flock, in symmetry, form, and substance. The other prizes went to the Ravenstone flock of Mr. R. W. Cresswell, which was capitally represented, showing that good Leicester sheep are still to be found in their native county. There was a more limited display of ewes, and, as stated by the Judges, they were not so even. Mr. W. Brown's first-prize pen contained two, with sweet countenances and magnificent frames, and the Thorpelands contingent, placed second, were formed after a very perfect model. Mr. Marris's ewes were also of sweet character.

Several more breeders of Cotswold sheep exhibited than usual, in consequence of which the shearling ram class formed a capital representation. Mr. Russell Swanwick always brings out good sheep, but in this instance, although he had five specimens, all fine, but not so thoroughly prepared for Show as usual, he could only obtain reserve, which alone proves how magnificent was the general collection. Mr. Thomas Brown, of Marham Hall, the well-known breeder of Norfolk Cotswolds, had six beauties. To two of them, of remarkably nice quality and capital wool, were awarded first and second prizes; while a third, possessed of a grand frame, seldom if ever surpassed for substance and symmetry, was highly commended. The third-prize shearling of Mr. S. Smith, of Somerton, seemed also a beautiful specimen, with his broad level back, capital loin, and generally well-developed frame. It is worthy of remark that Mr. Brown's highly commended sheep had a girth of 5 feet 5 inches.

Neither the older rams nor the ewes were anything like so numerous, but the former were of high merit, all coming from two celebrated flocks—those of Marham Hall, and the Royal Agricultural College Farm. Mr. Brown's old rams were not, however, equal to his shearlings, and all three prizes were awarded to Mr. Swanwick, for sheep, marvellous in build, grand substance, prime wool, and quality. They are specially mentioned by the Judges in their Report. Mr. Swanwick also won all the prizes in the ewe class with three tolerable pens, leaving Mr. S. Smith the reserve. The Judges' remarks on the Cotswolds are as follows:—

CLASS 91.—A good lot, with fine quality, and good wool.

In CLASS 92 there were three very fine sheep, and No. 964 was very full of wool and mutton.

CLASS 93.—We have seen better ewes, more evenly drawn for skin and size.

R. G. F. HOWARD.
T. PORTER.

The truly splendid collection of the Lincolnshire breed was not only large in numbers, but almost every animal had a magnificent frame and grand character. It is rare to find such well-filled classes exemplifying so thoroughly and with hardly any exceptions a higher degree of excellence than the average level of merit. The task before the Judges was peculiarly onerous under the circumstances, and when it is known that the assistance of a third Judge had to be rendered before the prizes in two of the classes could be decided on, the murmurs against their decisions which were made in the Showyard will be seen to have been without cause. The shearling ram class had no less than thirty-five entries, yet it was generally commended by the Judges. The contest between the two beautiful sheep of the Nocton Rise and Branston flocks was the old one of nice quality against substance in a grand frame. Both were almost equally deserving of an honour which could be only accorded to one, and it seems particularly satisfactory that in this dilemma the Judges called in a third party. But the third-prize and reserve rams were almost on a par with Mr. Howard's and Mr. Marshall's. The former belongs to the Northamptonshire flock of Mr. T. W. D. Harris, and seemed a very compact, squarely built, nicely woolled sheep. The latter did honour to Nottinghamshire and the flock of Mr. Henry Smith; and he is so well formed, with a straight back, well-sprung ribs, excellent plait and rump-end, that he will not unlikely develop into something marvellous another year.

The older rams were fewer, but of great merit. Of the first-prize one, belonging to Mr. J. Byron, of Kirkby Green, it would be impossible to speak in too high terms of commendation. He is a magnificent animal all over, with beautiful form, capital flesh and wool, and admirable character. The Judges had only less trouble in this class from his merit being so very striking. Still there were others who, in the absence of the chief winner, would have been deemed very perfect, especially the grand table-backed sheep of Messrs. Dudding and Mr. R. Wright, which received the other prizes. As for the ewes, according to the common verdict —fully endorsed it will be seen by the Judges—they have never been surpassed at any previous Show; and the same may no doubt be asserted of the Lincolnshire sheep, taken as a whole. The first-prize pen came out of Cambridgeshire, and it may be remarked that never before have so many counties furnished the Showyard with beautiful specimens worthy of prizes. This shows how rapidly this wealthy remunerative kind of sheep is being extended. Mr. Gunnell's sheep were very fine, and matched excellently, their lengthy massive forms all appearing as though cast in a common mould. With grand character, which no one disputed, their right to first place remained unchallenged; but the question was asked why, in a class of this high order of merit, both remaining prizes fell to one exhibitor? Here again it is satisfactory to find the decision was not arrived at without calling in another Judge; not that there need remain the slightest vestige of a doubt as to the correctness of the award, for there were impartial and experienced critics amongst outsiders who, regarding the compact, shapely forms of the Nocton Rise sheep, their good looks, heavy fleeces, and uniform character, gave them the preference even over Mr. Gunnell's. No one can deny, however, that the pens of Mr. John Pears and Messrs. Dudding were also very first-class indeed. With rare excellence in the general exhibits, discrimination must always be reduced to points of great nicety; and it may be accounted a great honour to receive the smallest commendation in such a collection as this. The remarks of the Judges are as follows:—

Class 94 was an excellent one of Lincoln shearlings; we have never seen a better. There was great difficulty in awarding the first prize, and another Judge had to be called in. The first- and second-prize animals were very fine, their quality of wool and mutton being very first-rate, and we had great pleasure in commending the class generally.

Class 95 was also good, although smaller in number; but we have seldom seen a better animal than the first-prize one, his wool and quality being so superior. The second-prize animal was a very fine sheep, but wanted rather more wool.

Class 96.—This was the best class of Lincoln shearling ewes we have ever seen, the first-prize pen being full of wool and quality, and the second and third prizes we could not award without calling in another Judge, who soon gave his decision. We commended the class generally.

R. G. F. Howard.
T. Porter.

Another highly popular breed of sheep is the Oxfordshire Down, and this, too, was so admirably represented as not merely to maintain the high position which it had previously attained, but to suggest that never before had a more splendid collection of animals of the correct type been brought together. The class for shearling rams had no less than twenty-eight entries, and the greater number were so superior that the Judges confessed the duty a most arduous and perplexing one satisfactorily to discriminate between so many animals of extraordinary merit. In making their draft of the really good, no less than a dozen were selected, and then the almost impossible task of extracting the *crême de la crême* presented itself. They at length fixed on a very grand sheep for first prize, belonging to Mr. Albert Brassey, whose massive form was well proportioned, with a plait and leg of mutton calculated to kindle fire in a grazier's eye. But one of Mr. Milton Druce's seemed well-nigh equal in a beautifully modelled form, with something more of quality, and to this they awarded second prize. The third prize was given to a sheep belonging to Mr. G. Wallis, of Old Shifford, which displayed a great deal of fine breeding in a compact, shapely frame. An honour of some kind was then bestowed on each of the other nine which made up the dozen, and no less than six of them were highly commended. Three of the latter belonged to Mr. Treadwell—to one of whom was accorded Reserve—another was from the flock of Mr. H. Barnett, and the other two were exhibited by Mr. A. F. Milton Druce and Mr. G. Wallis. The latter gentleman had no less than nine shearlings in this very good class.

Every animal in the next collection was of merit, and although the older rams were comparatively few, their high superiority made up for this, and thoroughly redeemed the character of the class in general estimation; Mr. A. F. M. Druce received first and third prizes, and a sheep of Mr. G. Wallis was put second. The type of the latter was more after the style of the Cotswold than an Oxfordshire generally displays; but Mr. Druce's first-prize ram was on rather short legs, with a compact, thick, deep frame, and his third had a grand table-back, with admirable character. There were six pens of ewes, the whole of which received honours; so that it may be considered that the Judges estimated very highly all three classes, and nearly the whole of the animals of the breed exhibited. Mr. Druce was victorious once more, although it was apparently a nice point which pen had most merit, his or the second-prize one belonging to Mr. J. Treadwell. Then again there seemed a very slight difference between Mr. Treadwell's third-prize ewes and those of Mr. A. Brassey, which received Reserve.

Southdown sheep have gradually been acquiring greater size, without losing the beauty of their sweetly moulded forms and that rare quality for which they have always been so highly distinguished. When these animals are removed from their native hills to better pastures, they naturally develop larger frames, but not always devoid of coarseness. The late Jonas Webb was the first to bring this grander form to such a high stage of perfection in rare quality, combined with great size, that Showyard honours were won by him in competition with the best of the Sussex breeders. Lord Walsingham, by adopting similar tactics, has produced some magnificent sheep of exquisite beauty, but of stouter build and more substance than are to be found in the native Sussex flocks. All his prize-rams owe descent to "Royal Manchester," who had a high reserve placed on him at the Merton sale in 1871, and fortunately was not disposed of in consequence. The extraordinary character of that celebrated prize-sire, and the marvellous results of his employment since then in the Merton flock, fully justify the confidence reposed in high breeding and the principle that "like produces like." He was never used elsewhere; and if Lord Walsingham's prize-winners exemplify an elegance of form which cannot be surpassed, combined with high quality and size, the superiority may be attributed to the impress of "Royal Manchester."

There were twenty-six entries in the shearling ram class, and even the Sussex breeders brought their sheep larger than they have been accustomed to do, so that there was a noticeable uniformity in this particular, which it will be seen the Judges remark on in terms of commendation. Lord Walsingham exhibited six, all bearing a strong family likeness in magnificent contour, with enlargement of frame, nice character and quality, and very prime legs of mutton. These took the first two prizes, two high commendations, and the Reserve. The first-prize one is very perfect indeed, and is to be retained for service in the Merton flock, for Lord Walsingham always adopts the excellent principle of keeping his best at home, whatever tempting offers may be made him to part with them. Sir N. W. Throckmorton exhibited two superior shearlings, to one of whom third prize was awarded, and to the other a commendation. The Duke of Richmond's beautiful specimens from Goodwood were commended, an honour also bestowed on one of the largest Southdown shearlings ever shown, belonging to Messrs. Heasman, of Angmering. Altogether the Judges noticed nine, which sufficiently proves how high the class commended itself to their estimation.

The older rams were to the number of seventeen entries, and exemplified very fully the same notable features of high quality in beautiful forms. Lord Walsingham received the first and third prizes and also the Reserve with splendid specimens—the best having since crossed the Atlantic for the Philadelphia Exhibition. This sheep, although only highly commended last year at Taunton, attracted the particular notice of Mr. H. Overman, one of the Judges, who predicted that, with good treatment, the ram would develop into a first-prize winner. The excellent plait and forequarter of this sheep are remarkable, and his girth reaches 4 feet 9 inches; but the second-prize animal, belonging to Mr. J. J. Colman, M.P., was of nice character also, with a girth equal to the one just remarked on. Lord Walsingham's third had a particularly nice touch, and his Reserve sheep seemed scarcely inferior to either of the others put before him. This should prove how close was the competition. But there were six other very superior sheep in the class. H.R.H. the Prince of Wales was highly commended with a straight-backed, well-shaped specimen; and the like honour was accorded Mr. Rigden and Sir W. Throckmorton, for grandly backed sheep, with excellent character. Three other rams, belonging to the two exhibitors last named and Mr. J. J. Colman, M.P., were also commended. No fewer than ten sheep altogether were consequently honoured.

Great size, combined with good quality, was also the prevailing feature of the Southdown shearling ewe pens. Lord Walsingham's star was once more in the ascendant, and the Judges would have erred had they not placed his massive, lengthy, handsome ewes in the front; while the evenly matched pen of sweet character, belonging to Sir N. W. Throckmorton, seemed to assert just as decidedly their right to second place. But there was a very close contest indeed between Mr. Colman's third-prize pen and the Duke of Richmond's Reserve before these distinctions were affixed, and the Judges had to discriminate attentively and expend a considerable time on the labour before determining what to do. A very nice pen, belonging to H.R.H. the Prince of Wales, was commended.

The Judges' Report on the Oxfordshire Downs, Southdown, and Hampshire classes, is as follows:—

Class 97—*Shearling Oxfords*—was as fine a class as we have ever seen exhibited, and gave us much trouble to select the prize animals, many of which were of equal merit; and we commend the class generally as being a very useful lot of sheep.

In Class 98 the entries were not so large; but as we noticed the whole of them, this is sufficient to show they were all good specimens of the breed.

Class 99—*Shearling Ewes*—numbered only six entries; but those selected for the prizes were considered of very equal merit.

Class 100—*South Down Shearlings*—came out in great force, and was as good a class as we have seen exhibited for some years, being of a larger size, and not deficient in quality.

In Class 101 we found a remarkably fine class of sheep, of good use and quality; and

CLASS 102, for *Shearling Ewes*, was a very fair one, many of them being of great size and good quality.

We consider all the classes in Oxford and South Downs to be better represented than we have seen them for many years.

In the classes of Hampshires and other Short Wools there was little competition. Some few of the animals were of superior quality, and we very highly commend a pen of Dorset ewes, but consider they ought not to compete with Hampshires.

HENRY FOOKES.
JOHN BRYAN.
WILLIAM BULLEN.

The smallness of the Hampshire classes seemed to afford a strange contrast to the fulness of some of the others; but in this part of the kingdom no other result was to have been expected. There were only four shearling rams from two exhibitors, Mr. Alfred Morrison and Mr. G. W. Homer. Those of the former received both prizes, and were grand-looking shearlings, lengthy, with straight backs and good substance, such as would probably have won with far greater competition. Mr. Homer's had very nice quality, however, and both received notice from the Judges. In the older ram class there were the same number of sheep, Mr. Morrison exhibiting two, as before; but he had to be content with a high commendation and a commendation for these, Mr. T. Chapman Saunders winning both prizes with two beautiful sheep; the first-prize one, in particular, being quite a paragon in symmetry, high quality, thick flesh, and superior wool, all combined in a grand frame. This noble sheep is particularly good in points wherein Hampshires are usually defective, being very full behind the shoulders, and having a neat pretty head, with pleasing countenance. He stands wide before, with a wealthy bosom declining low, and his leg of mutton seems equal to that of a Southdown. If the true Sussex quality and beauty of shape can be imparted to an enormous frame, we have it here.

Mr. T. C. Saunders had also the post of honour in the ewe class with a pen of beauties, bearing a striking resemblance in character to the ram just described. Mr. Morrison did not enter any ewes, but there were three other pens in the class, one belonging to Mr. G. W. Homer, which received second prize; a pen from the superior flock of Mr. J. Walter, M.P., to whom was awarded Reserve; and one of Dorset Horns, exhibited by Lord Bridport, which the Judges highly commended. It will be seen that in their Report they remark on the circumstance of sheep of opposite characteristics in everything but length of wool being allowed to compete together. Scarcely a Show is ever held, however, without some slight amalgamation taking place in breeds inadequately represented. The last section in the sheep department was styled "Hampshire and other Short-woolled Sheep," which rendered "Dorset Horns" eligible. This particular pen seemed out of place only because all the other sheep were virtually of one breed, although Mr. Saunders's were termed "West Country Downs," Mr. Homer's "Dorsetshire Downs," and Mr. Morrison's and Mr. Walter's "Hampshire Downs."

Shropshire sheep were destined, as predicted, to form a leading feature in the grand display. Birmingham has always been regarded by the flockmasters of that breed as a central market for the disposal of their specialities, and it was only natural that the Birmingham Local Committee should regard this department with more favour than any other belonging to the woolly tribes, and lavish on it their prizes; but Classes 103, 104, and 105 were numerously filled, because the Showyard was near and convenient for the principal breeders. The former, for shearling rams, seemed enormous in proportions, no less than seventy-two entries appearing in the catalogue. The Judges had, of course, a difficult task on their hands, rendered all the more so by the even merit of several of the animals exhibited. The shearling they eventually selected for pride of place is a neat, rather small, but thick son of Lord Chesham's well-known "Duke of Bedford." He has a sweet mellow touch over the back, a good loin, with wide hips, but is rather weak at neck and behind shoulders. Mr. Minton, the owner, may well be congratulated, for he is new to the Showyard, and yet has beaten Lord Chesham's crack shearling, although, it must be admitted, by employing some of his Lordship's best blood. The shearling placed second did, however, great credit to the Latimer flock, as did also three other noble sheep at his side of Lord Chesham's breeding. Prime as its outcomes always are, it may be questioned if they have ever been excelled: the only difference to be detected being that the Latimer shearlings of the present year seem to be larger in size than they have hitherto been, by which, however, they approximate more closely to the standard said to be required. The second-prize one possessed a grand frame, with capital rump-end and legs of mutton. Of larger size than the first-prize ram, he came very near him in symmetry and good quality; and with two so evenly matched, the task must be invidious in preferring either. Mr. Sheldon's third-prize sheep displays well-nigh the neatness and nice character of a Southdown. The Reserve was given to a lengthy, fine sheep, of quite another stamp, belonging to Mr. T. Fenn; while Mrs. Beach and Mr. T. Mansell were highly commended for two grand-looking ones; commendations were also awarded to the latter breeder, to Mr. J. L. Naper for two brought from Ireland, to Mr. J. Pulley, and to Mr. J. Coxon.

The class for older rams was likewise large, numbering thirty-two entries, and of unquestionably high merit. It augurs well for the latent vigour to be found in flocks of this breed, when in both ram classes new exhibitors are to be found taking the first prizes. Mr. H. Townshend's grand sheep, which was preferred to any other, had never been off the farm where he was born and bred, it is stated, until brought to Aston Park. He is very full and uniform throughout, presenting a magnificent model of great expansion combined with nice character, and may be deemed an excellent specimen of the true type of the breed. Mr. E. Crane's second-prize ram is low to the ground, but compact and massive in frame; and Mr. Sheldon won third prize in this as well as the shearling class, but with sheep of differing types, one being large in stature, with a grey face, while the other was small and had a very black face. Mr. Baker, of Moor Barns, took the Reserve, and Mr. W. O. Foster a high commendation for sheep good in form, and of excellent quality and wool; and Mr. Smith, Mr. J. Pulley, Mr. F. Bach, Mr. Firmstone, and Mr. T. Mansell, were commended. Lord Chesham had nothing in the class. His celebrated "Duke of Bedford" appears in the catalogue, but was absent.

The Latimer flock will, however, be found completely in the ascendency in the class for shearling ewes with beautiful sheep, sweetly modelled and full of good mutton and wool. But there were several other pens which ranked high. Mrs. Beach's seemed compact in build, small, but handsome; Mrs. Smith's very uniform, with deep, capacious frames, and nice character; Mr. C. Byrd's stylish and pretty; and Mr. J. Pulley's stout-built, and very useful, almost approaching the standard of the third-prize pen, between which there was some resemblance. Mr. J. W. Minton was also commended for a nice lot. In a smaller class of older ewes Mrs. Beach, of The Hattons, came to the front with a beautiful pen. The other exhibitors were chiefly Salopians, who brought some admirable specimens into the arena. The lambs were very creditable specimens, of which there were ten pens of ewe-lambs and fourteen of ram-lambs; Mrs. Beach taking firsts in both classes, Mr. C. Byrd a second in one and a third in the other, with Mr. T. Mansell and Mr. T. J. Mansell securing the others.

There were some evenly topped, admirably shaped wethers in the seven pens brought into competition. Lord Chesham's were most admired and placed first, with Mrs. Beach's second, the Earl of Zetland's third, and Mr. Yates's taking Reserve. The Special Prize to the exhibitor securing the greatest number of points in the Shropshire classes, was awarded to Mrs. Beach. The Report of the Judges is to the following effect:—

Shropshire Sheep.

In presenting our Report on the Shropshire sheep exhibited at Birmingham, we congratulate the Society on having obtained so large an entry, and we also congratulate the breeders on the important exhibition made by them, which must be deemed one of the most attractive features of the Show, their numbers being as follows:—

Class.	Description.	No. of Entries.	No. of Sheep.
103	Shearling Rams	72	72
104	Aged ditto	32	32
105	Shearling Ewes	21	105
106	Stock ditto	10	100
107	Ewe Lambs	10	100
108	Ram ditto	14	70
109	Yearling Wethers	6	30
		165	509

From the above great number of entries we were pleased to find but very few absentees. In making our awards we exercised a desire to select for prizes those animals which we considered best calculated to uphold and perpetuate the most distinctive type of the Shropshire, namely, a well-developed head, with clear and striking expression of countenance, a muscular neck, well set on good shoulders, the body symmetrical and deep, placed as squarely as possible on short legs—due regard being paid to grandeur of style—a well-covered head, and wool of the best staple and most valuable kind, rejecting as much as possible all animals showing an inclination to produce black wool or dark skins.

Class 103. *Shearling Rams.*—We do not consider the sheep in this class as good individually as some we have seen in former years; but, taken as a whole, they must be pronounced a grand lot. The wool in some cases was not of that texture and quality we are desirous of seeing, and in making our awards we had a difficulty in finding animals of the true Shropshire type. The first-prize sheep is a good representative of the breed, but not without faults. The second is a more robust animal, but deficient in some of the most essential points. The third prize was a sheep of good quality both in mutton and wool, but rather lighter in feature than the other selected ones. The Reserve Number was a good animal, slightly open in wool.

Class 104—*Aged Rams*—were a splendid class, and some very good selections were found here. The three prize-sheep were of uniform type both as to wool and colour. The Reserve Number was a good animal. Our commendations in this class were numerous.

Class 105—*Shearling Ewes*—were an admirable lot, the first-prize pen being particularly good. The second-prize pen were also beautiful ewes of grand character. The third-prize pen was scarcely so uniform, but good ewes.

Class 106 were a good lot of sheep, and great uniformity of character was perceptible in many of the pens.

Class 107. *Ewe Lambs.*—Many of the pens in this class were particularly good, well matching, and of beautiful character.

Class 108. *Ram Lambs.*—There were some very good specimens shown.

Those selected were true in type, and several of the other pens were of good quality. No. 1284 were a great pen of lambs, but scarcely matching in feature.

Class 109.—This was a special prize for yearling wethers, and brought together a lot of good sheep calculated to supply a good quantity of mutton and high class of wool. The 25*l.* plate for the greatest number of points was awarded to Mrs. Beach. The points were calculated for first prize, 3; for second prize, 2; for third, 1. The winner secured 13. Lord Chesham was second with 8 points.

We would here remark that it is most desirable for ram-breeders to be more careful in the selection of sires, to secure an uniform class of animal; and we think a breeder can make no greater mistake to his own interests, while he, at the same time, will ultimately deteriorate the breed of Shropshires, who uses sheep of a spurious character in order to secure an increase of size, and a questionable increase in the weight of wool. We desire to urge upon sheep-breeders the necessity of paying attention to these points, as also to the undue length of the ears—which in some cases causes a vulgar appearance—and also to the somewhat variable character of the fleece. It is our duty to observe that the whole of the classes compare, in our opinion, most favourably with other breeds, and warrant us in recommending the Shropshire sheep as an object especially deserving the attention of the practical and rent-paying agriculturist.

R. H. Masfen.
John Evans.
Henry Lowe.

There were few disqualifications of any sort, taking the stock as a whole, and sheep were entirely exempt from them. The Society may be heartily congratulated on the circumstance, and the subjoined Report from the Inspectors of Shearing will be read with interest:—

It is with very great satisfaction the Inspectors have to state to the Council that they found the whole of the sheep in the Yard well and fairly shorn. The change brought round in a few years is something wonderful, as the great difficulty was to find sheep in the Yard that were equally shorn. To correct this general system of false shearing, your Inspectors did not condemn all false shearing, they only took the worst and most glaring cases, and recommended the Council to disqualify such. This was carefully done, and has led to the result of having a clear sheet, and not a single sheep in the Yard that we could find fault with. We congratulate the Council in having so fully corrected that system of false shearing, and in so short a time done its work effectually. It also recommends itself to other Agricultural Societies, your Inspectors having had invitations to attend the Royal Society of Ireland at Cork this season. The sheep are now shorn in their natural and true shape. We feel satisfied that the great improvement in shearing will lessen the labour of the Judges of sheep, and enable them to come to a more correct decision than they could do in former years. We trust that exhibitors will profit by past experience, and bring out the sheep-stock in their true and natural form, as has been so well done this year.

William Jobson.
J. B. Workman.

Pigs.

The porcine Exhibition, if not so large as on some previous occasions, was characterised by an uniformity of high-class merit in the sections generally, with an absence of inferior animals, which particularly impressed itself on all observers. Lord Ellesmere appears to have brought the large white breed to great perfection in his piggeries. His Lordship heads both boar classes and the single sow class with beautiful specimens, displaying rare quality in hair and skin, combined with size and symmetrical proportion. Mr. Jacob Dove's young boar came very near his victor, however, in admirable form; and although the beautiful four-year-old pig, who has conquered in so many fights, was not to be approached, Mr. Duckering's "Cultivator" seemed a very worthy second. These classes, as well as the class for young sows, three of a litter, were somewhat short, but the old breeding sows were excellently well represented both in numbers and high quality. The fact of the entire class with fourteen entries being commended, must be taken as testimony to its worth. Another may be found in Mr. Duckering's "Queen," the heroine of several preceding fields, being fairly surpassed by an almost perfect specimen, who, although entered as of unknown parentage, appears, after all, to be from one of the Earl of Ellesmere's own choicest strains.

The small whites were, many of them, anything but diminutive, but Mr. Jacob Dove's young boar, who took first prize in Class 117, presented a very sweet model, exceedingly nice in character, with merit calculated to disarm adverse criticism at every point. A large majority of the others in this well-filled class, although well shaped and of excellent quality, seemed altogether out of place in a collection professing to belong to the "small breed." While the older boars were similar in numbers, they possessed far higher merit. The Earl of Ellesmere's beautiful specimen, who had previously conquered at Doncaster and Preston, was placed first, with an immense but good pig second, belonging to Mr. Peter Eden. The reserve was given to Mr. Duckering's "Champion," also rather large, but prime in flesh and nice development. The stylish, well-shaped boar, "Barrister," belonging to Lord Moreton, was deservedly highly commended; for this animal, like Mr. Dove's in the younger class, seemed legitimately to belong to the small breed. The whole of the others were commended.

It appeared somewhat remarkable that, while neither "hilt" class of the white breeds displayed more than average merit, the older breeding sows were very superior; Class 120, to an extent that so thoroughly impressed the Judges that they highly commended it in its entirety, although comprising fourteen entries. The first-prize pig belonging to the Earl of Ellesmere was superb in quality, and a very perfect model from nose to tail. The second, from Mr. Dove's herd, seemed sweet in character, with an almost perfect back, while the reserve sow, also from the Worsley herd was scarcely inferior to either.

In the small black section of the porcine display the two classes of boars were only moderately filled, and only the prize-animals were considered by the Judges of high merit. The Earl of Portsmouth furnished both these in the younger, and Mr. G. M. Sexton both in the older class. The entire four came very near perfection in contour and nice character. But the breeding-sow class fully redeemed the small black breed from mediocrity. There were several first-class animals in a respectable collection as regards numbers. Mr. W. Wheeler took first, with a beauty of very large proportions; Mr. G. M. Sexton had three very first-class sows in the collection, taking second and the reserve with two of them; and the entire class was commended.

Of Berkshires there was a large collection, containing not a few animals of remarkable merit; but there were others of very moderate character indeed; so that, on the whole, this department in the Show could scarcely be regarded as equal to some of the Society's previous exhibitions. I perceive that the Judges notice the "large entry of moderate animals" in the young boar class, and assert that several were of great size lacking quality in the other; but I am glad they allude in high terms of approval to "Pulchritude," Mr. Heber Humfrey's first-prize pig in the latter class, who is so devoid of coarseness, and yet answers very fully the requirements in regard to size. This beautiful animal left the Aston Yard to cross the Atlantic, having been sold to an American gentleman expressly for exhibition at the Philadelphia Exhibition.

As the breeding-sow class redeemed each of the preceding breeds from indifferent display, the same feature was recognisable in the Berkshire section to a far greater extent. This so impressed itself on the Judges that they have termed Class No. 128 "the best in the yard." They also point in their Report to Mr. W. Yells' beautiful sow, which took first prize as bearing "the true type of a Berkshire pig." This verdict will be very generally endorsed, and little surprise will be felt that so good an animal found a purchaser at an exceedingly high figure on the Showground. Mr. B. St. John Ackers is now her owner, together with her family of eight babies. Sir N. W. Throckmorton's "Young Stourbridge," and Mr. Spencer's "Princess 10th," came very near each other in point of merit, the latter showing a depth both of fore-flank and carcass seldom equalled. But the former had a grand model, too, almost faultless in uniformity. Her high quality probably gave the cast, and she was awarded second prize, and the latter Reserve. At least half-a-dozen of the others in this large class of eighteen entries might, with justice, be described as superior to the average of first-prize takers.

There were four additional classes provided for other breeds not previously represented. The "Middle White" predominated, and there were some few admirable specimens belonging to it. The young boars of Mr. Duckering and Mr. R. Tommas, to whom the Judges awarded prizes, seemed shapely in form, and of admirable flesh and quality; and there were three beauties in the older boar class, two of whom came from Worsley, and the other from Mr. Tommas's herd. In company with them was a curiosity of the old Tamworth breed, whose snout was well-nigh half the length of some of the other pigs' bodies. Mr. Tommas may be congratulated on sweeping off a large proportion of the prizes in these classes, as, in addition to those named, he won a prize with a sweet pen of young sows, styled "Faith," "Hope," and "Charity;" and a second in the older sow class with "Minerva." All his pigs seem to possess good form, combined with nice character. The first-prize winner in the last-mentioned class was a very fine lengthy sow, called "Lady Cobden," white with blue spots, belonging to Mr. Peter Eden.

The following is the Judges' Report:—

We have much pleasure in reporting that the Show of Pigs bears a fair comparison with former years.

Class 113 contained six entries, among which we found nothing worthy of particular notice except the prize-animals.

Class 114 contained no animal worthy of special notice.

Class 115.—This also was a moderate one, with pens of animals very unequal in size, and deficient in quality.

Class 116.—In this class we found a great improvement upon the three former classes, it containing a large entry of very fine animals; the first and second-prize animals were of good quality, carrying a great weight of flesh with small bone. The whole class was commended.

Class 117.—A large entry, with no animal of particular merit, except the first-prize one.

Class 118 contained many animals of superior quality and great merit. The whole class was commended.

Class 119 very inferior; we found much difficulty in awarding the prizes, the animals being of a mixed breed.

Class 120.—A large entry of superior animals, the whole class being highly commended.

Classes 121 and 122 contained nothing of special merit, except the prize-animals.

Class 123.—No entry.

Class 124.—A large entry, containing animals of superior merit; the whole class was commended.

Class 125.—A large entry of moderate animals.

Class 126 contained eleven animals of great size, many being deficient in quality and form; but we consider the first-prize animal one of superior merit.

Class 127 contained no animals of special notice.

CLASS 128.—This we consider the best class in the Yard, containing eighteen entries of animals of superior quality. The first-prize sow we consider a very superior animal, possessing the true type of a Berkshire pig.

CLASS 129 contained nothing worthy except the prize-animals.

CLASS 130.—A small entry, but the prize-animals were very superior indeed, the hair on them being of superior length and fine quality.

CLASS 131.—A small entry, containing no animal of special merit.

CLASS 132.—A small, moderate class.

We are much pleased to find that fewer disqualifications occurred upon this than on some former occasions.

We cannot conclude our Report without bearing our testimony to the good conduct of the herdsmen, who were most civil and obliging, and used the greatest exertion to show the different animals to the best advantage.

From our Steward we received the greatest kindness, assistance, and courtesy.

JOSEPH SMITH.
MATHEW WALKER.
AUGUSTUS WARBURTON.

WOOL.

A feature of great interest in the programme this year, which has not as yet received adequate support or excited anything like the amount of attention it deserves, is the exhibition of wool. In the improvement of flocks, and particularly in the selection of rams, securing a heavy-weight fleece is more thought of than the growth of wool of the best possible quality consistent with the capabilities of the particular breed considered best adapted to the farm or district. These are serious defects to which some of the highest bred flocks are liable, and they can only be detected and guarded against by critical examination. No one can peruse the appended Report without entertaining a higher appreciation of the utility of offering prizes for wool. The remarks on the advantage of growing wool free from grey, are particularly valuable. But the fleece is often affected by management, and there are a number of little details connected with clean-washing, the length of time which should elapse between washing and shearing, the preservation of wool in the yolk, proper sorting, packing, &c., which to a considerable extent are calculated to determine value. All these receive elucidation in this competition. The following is the Report of the Judge of wool:—

At the request of the Council I undertook the office of Judge of wool at the Birmingham meeting, and I have to report that in CLASS 133—*Six Long-wool Teg Fleeces*—two lots only were entered for competition, both of which belonged to the same exhibitor, Mr. Harris, of Stonylane House, Bromsgrove, but they were entirely different kinds—No. 1, pure Leicester; No. 2, cross Leicester and Shropshire. No. 1 was what is technically called long-wool, but this kind being at the present time little in demand, I awarded the first prize to No. 2, being much more saleable. I am of opinion that it should have been more clearly stated as to what long-wool was, whether pure-bred Leicester, Lincoln, or cross-bred, which might have induced more entries.

CLASS 134. *Six Short-wool Teg Fleeces.*—In this class were thirteen competitors. Many of the lots were more properly adapted for the long-wool class, as it was fettered with no conditions. I awarded the first prize to No. 6, Mr. John Hill, Felhampton Court, as I considered it was short wool, fine quality, well washed and managed, free from grey, which to my mind is a great recommendation and not sufficiently thought of in the selection of rams and ewes for breeding purposes by farmers in general, but of great consequence to the users of wool. The second prize in this class, No. 9, to Mr. John Peake, though not so fine as No. 6, was short in staple, very well washed and managed, being also free from grey. No. 13, highly commended, I considered good Shropshire, but was too long in the staple to be entitled to a prize in the short-wool class.

John Webster Mayou.

Butter and Cheese.

The shed appropriated to an exhibition of dairy products attracted great interest in Aston Park, and the hope may be entertained that every successive year will extend this highly important branch of competition. The entries of butter were large, amounting to no less than forty, and they were also excellent in quality, colour, and firmness of texture, taken generally. The Judges, after awarding first prize to Mr. C. Pratt, of Budbrooke, Warwick, and the second to Lord Chesham, bestowed four high commendations and the same number of commendations. The exhibition of cheese does not appear to have been of the same high character, and it seems a matter naturally to excite surprise that at a period when we hear so much of the highest art being brought to bear on cheese-making and of the systematic embodiment of every provision calculated to ensure the manufacture of high-class goods through the factory system, that the practical results are no better. There were eleven entries in the "over six inches thick" class, and seventeen in the class for thinner cheese. It may be worthy of remark that there was an exhibit of factory cheese in each, both of which, however, were passed unnoticed. The Report of the Judges is as follows:—

The Judges have to report that there were thirty-nine lots of butter exhibited, the general quality of which was fairly good. The first-prize dairy, No. 47, was most excellent both in colour, texture, and flavour; and the second prize, No. 21, was nearly equal to it, the only difference being that it was not quite so rich. These two lots left little to be desired. In the remainder of the class the Judges were able to award a high commendation to four samples, and also to commend four others. In the Classes for thick and thin cheese the Judges were not so fortunate, and regret to say that the general quality of the cheese exhibited was very inferior, and they had difficulty in selecting the prize lots. It must be borne in mind that the present season of the year is an unfavourable one for the exhibition of raw cheese, and some of the samples shown will improve very much in the course of a few months.

H. Chandos Pole-Gell.
S. Walker Cox.
James Watson.

XXIII.—*Report on the Exhibition of Implements at Birmingham.*

By Jabez Turner, of Haddon Grange, Hunts, Senior Steward.

The task of writing a General Report on the Exhibition of Implements in the Show-grounds of the Royal Agricultural Society of England becomes more difficult each year, as the Stewards employ different modes of expression, and the actual Shows are in their main features identical. It seems to me that I am especially unfortunate in following so accomplished a writer as my immediate predecessor.

It was generally admitted by the most experienced officials of the Society that never since its inauguration has the Exhibition been held in a Showyard so picturesque in itself, so fortunate in its accessories and surroundings, and so well adapted for the purposes for which it was intended. The expenses attending the levelling, drainage, road-making, &c., must have been very considerable; the works were carried out by the Local Committee in the most thorough manner, and the general appearance of the yard, when viewed from the main entrance, elicited from all classes of visitors expressions of pleasure and admiration as they gazed over a scene not easily to be forgotten by those who saw it on the two last days of the Show, when very nearly 120,000 persons paid for admission. The weather was all that could be desired, and it was most interesting to watch the crowds as they entered proceed in different directions towards the objects which possessed attractions for them individually. I was somewhat surprised to see vast numbers turn off to the left, and go at once to the steam-engines in motion, the hum of which appeared to be irresistible; and the intelligent appreciation they showed of the different machines was gratifying and remarkable. But the sight of the yard on the last day was the parade of horses, as viewed from the horse-ring. In every direction from the centre a vast sea of faces, filling what may fairly be termed the amphitheatre, met the eyes of the officials—faces radiant with pleasure and good-humour, as was clearly evinced by the applause freely given when any of the animals did anything not strictly according to programme. The Showyard was arranged in a somewhat irregular fashion, in my opinion a great improvement on the rectilineal plan which has prevailed on previous occasions. This irregularity, combined with the boundless look of the place, owing to the outside hoarding not being visible in any direction from the main entrance, gave, in conjunction with the noble mansion of Aston Hall, and the trees and fountains of the lower park and gardens, a spectacle which has never during my experience been equalled in the Showyard of the Royal Agricultural Society of England, except, perhaps, in the Royal Park of Windsor in 1851. The hospitality of the Mayor and Corporation, and of the people of Birmingham, was dispensed most freely; the dinner given by the Mayor in the banqueting room of Aston Hall being specially noticeable for its excellence, and the kind welcome given to the representatives of the Society.

The railway arrangements were the câuse of some difference of opinion at the "General Meeting of Members," the customary vote of thanks to the Companies being refused by a large majority. This censure, however, must be considered as applying to the accommodation provided for passengers and stock only; for as far as the delivery of implements and goods into the Showyard is concerned, I believe that it has never been better managed; 1500 truck-loads of machinery, implements, and goods were handed over to the officials of the Society, and in no instance was a truck which arrived during the day left unloaded at night. This fact, in connection with the immense number of articles transmitted, and the few cases of damage, must be considered eminently satisfactory. The difficulty with passengers and stock appears to have arisen from the different Railway Companies not working sufficiently in conjunction with each other; another source of complaint against them is, that they provided no extra facilities for the members on any but the two last days of the Show.

The police arrangements were most efficiently carried out, and it is satisfactory to remark that, during the continuance of the Show, notwithstanding the vast number of visitors, no case requiring police interference was reported.

A novelty in the Showyard this year was the establishment of a "Members' Club." This arrangement, if continued, will afford much comfort to members and their friends, especially if, in addition to the set luncheon, a buffet be established at which light refreshments of good quality can be obtained.

Before I quit the subject of the general aspect of the Show-ground, I must remark that many of the stands of implements were arranged in a very artistic manner, and added much to its appearance. The arrangement of the summer-houses and bridges, combined with the large number of green-houses and conservatories down by the lake, gave that portion of the ground quite a festive character.

The show of Implements was larger than that of any previous year of which I have record, numbering 6414 entries on 420 stands, against 4230 on 277 at Taunton, 5931 on 361 at Bedford, and 5634 on 329 stands at Hull. There was no very striking novelty; but the workmanship of the several exhibits showed in many instances a decided improvement.

The regulations of the Society provide that the silver medals shall only be awarded to a machine which is so superior in novelty of design and adaptation to its particular purpose, as an agricultural implement, as to call for special recommendation, or where it contains the germ of such apparent excellence that its further development is desirable. The Stewards found only three implements which fulfilled these conditions. The first of these, in Catalogue order, was Aspinall's Potato Digger, No. 1885, exhibited by J. W. Robinson and Co., of 125, St. Anne Street, Liverpool. This machine, which may be termed a sequel to the "Potato Planter," which received a silver medal at Taunton, fully satisfied the Judges by performing its work in a practical and efficient manner.

The next medal was given to Messrs. Hayward Tyler and Co., for (No. 5206) their Caloric Engine for Pumping Water, driving chaff-cutters or any other work not requiring more than two-horse power. This, as explained by the Society's engineers and the exhibitors, appears a very economical power, claiming to raise 700 gallons of water per hour 70 feet high, using in a day of ten hours only 20 or 30 lbs. of coal.

The third medal was awarded to Messrs. Marshall, Sons, and Co., for No. 5760, an adaptation of a band-cutter to a self-feeder for a corn-threshing machine. This ingenious apparatus cuts the bands of the sheaves by three saws, which revolve transversely, at about 160 revolutions per minute, in front of the feeder. It was tried carefully by the Judges, and although not always successful, yet, with a little knack on the part of the workman, seems calculated to perform the work intended satisfactorily.

The "Sheaf Binder" (No. 1902) of Walter A. Wood, which was exhibited without being attached to a reaping-machine, appeared on the stand equal to performing its duty; but the Judges, not having any opportunity of testing its merits in a crop, could only form a superficial estimate of the actual benefit of a machine necessarily of such a complicated character.

I now proceed to notice the Implements, as entered for trial, and here my task is materially lightened by the fact that the trial of reaping-machines did not take place until harvest-time, and a detailed account of the merits of the different machines will be written by the official reporter of the Society. The crops on which the machines were tried were on the sewage-farm near Leamington, the property of the Earl of Warwick, who kindly placed them at the service of the Society. They were viewed by the Stewards during the Show, and appeared calculated to give a thorough trial to each implement. This expectation was fully justified by the results. It is to be regretted that several large firms of reaping-machine makers have abstained from entry; but if they refuse to avail themselves of the facilities for trial afforded by the Society, they are doubtless prepared to abide by the consequences of non-competition. These trials are considered by practical men to be productive of much good, and it must be admitted that they are of so exhaustive a nature that none but the machine which satisfies the Judges of its excellence in every particular can attain the first place; and under the present system of judging by points, it is next to impossible for any but the absolutely best machines to be indicated for the prizes. The paucity of competition referred to, although detracting in some degree from the general interest of the trials, will have the effect of stimulating new and enterprising makers, and will doubtless lead them to increased efforts to improve their machines up to the standard of excellence required by the Society's Judges. As the trial of implements is at present the speciality of the Royal Agricultural Society of England, I should think that the Society will be ill-advised to abandon the prize system which has, at all events, accompanied, and, in my opinion, has much assisted, the remarkable development of agricultural machinery during the last quarter of a century.

Two reaping-machines exhibited at Birmingham, and "entered for trial," were removed after the conclusion of the Show, in direct contravention of the Regulations of the Society. It will be for the Council to consider if means cannot be adopted which will effectually prevent such an occurrence in the future.

The Stewards having laid out the different plots on Saturday, the 12th, Mr. Tough the bailiff rendering most efficient assistance with men and horses, the Judges commenced their work on Monday, the 14th of August, under circumstances which will long be remembered by those who were forced to endure the almost tropical heat of the sun and the concomitants of a sewage-farm. On Tuesday night a heavy thunder-storm cleared the air and cooled the ground, and on Wednesday and Thursday the work progressed under more favourable conditions. On Friday and Saturday rain fell heavily in the morning and prevented the trials being finished until the following Monday. The state of the crops, in consequence, made the concluding trials of more value, and tested the relative merits of the different machines most completely.

Amongst the novelties in reaping-machines tried was the Steam Reaper of Messrs. Aveling and Porter, who are so well known for doing by the agency of steam all sorts of things formerly considered impracticable. This magnified swather, which is made by Messrs. Crosskill of Beverley, was shown at Birmingham, and attracted considerable attention there. It was driven at Leamington by an 8-horse power crane-engine, and pushed its way into and about the fields in a most extraordinary manner, cutting a width of 12 feet and delivering a swathe so perfect as to surprise most of the spectators and delight all. The Stewards with some difficulty arranged a final trial for this machine on a hill side, to take place on Friday morning, but the rain came down so heavily, that, after going once round the field under circumstances of great difficulty, the rest of the crop was left for suitable weather. The engine, however, propelled the machine up an incline of about 1 in 10 without the assistance of spikes, and the machine showed itself equal to cutting any crop which another machine could manage. The Judges recommended the Gold Medal of the Society to be given for this combination of machines, a recommendation which was cordially endorsed by the Stewards.

The results of the completed trials are contained in the following copy of the Judges' Award received on Monday evening, August 21st. The respective mechanical details and performances will appear in the official Report.

JUDGES' AWARD.

CLASS I.—*For the best Reaping Machine, with Self-Delivery in Sheaf, clear of the Horse-track.*

First Prize of 30*l.* to Richard Hornsby and Sons (464), for Patent "Spring-Balance" Self-Raking Reaper, marked B.

Second Prize of 20*l.* to Richard Hornsby and Sons (463), for Patent "Spring-Balance" Self-Raking Reaper, marked A.

Third Prize of 10*l.* to Richard Hornsby and Sons (466), for Patent "Spring-Balance" Self-Raking Reaper, marked D.

Highly Commended, Richard Hornsby and Sons (469), for Patent "Spring-Balance" Self-Raking Reaper, marked G.

Highly Commended, Richard Hornsby and Sons (467), for Patent "Spring-Balance" Self-Raking Reaper, marked E.

Commended, The Johnston Harvester Company (378), for New Wrought-Iron Self-Delivery Reaper.

CLASS II.—*For the best Reaping Machine, with Self-Delivery in Swathe, clear of the Horse-Track.*

First Prize withheld.

Prize of 10*l.* to the Beverley Iron and Waggon Company (Limited) (3150) for Improved Three-horse Reaper, with Double Self-Acting or Reversible Swathe Delivery.

In this Class none of the machines satisfied us in their work as Swathe-Delivery Reaping Machines, and the above award is all we recommend.

CLASS III.—*For the best Combined Reaping and Mowing Machine, without Self-Delivery.*

First Prize of 15*l.* to Richard Hornsby and Sons (473), for Patent "Paragon O" Combined Mower and Reaper.

Second Prize of 10*l.* to Richard Hornsby and Sons (475), for Patent "Paragon N" Combined Mower and Reaper.

Third Prize of 5*l.* to Richard Hornsby and Sons (474), for Patent "Paragon A" Combined Mower and Reaper.

Highly Commended, Richard Hornsby and Sons (476), for Patent "Manchester" Combined Mower and Reaper.

CLASS IV.—*For the best One-horse Reaping Machine.*

First Prize of 15*l.* to Richard Hornsby and Sons (482), for Patent "Spring-Balance" One-horse Reaper, marked M.

Second Prize of 10*l.* to Richard Hornsby and Sons (481), for Patent "Spring-Balance" One-horse Reaper, marked L.

Third Prize of 5*l.* to Richard Hornsby and Sons (479), for Patent "Premier" One-horse Reaper, marked I.

Highly Commended, William Mattison (572) for One-horse "Yorkshire Champion Reaper No. II."

The Judges also recommend the award of a Special Gold Medal to Messrs. Aveling and Porter, for their application of Steam-power to a Reaping Machine (Article No. 2120 in the Catalogue of Implements exhibited at Birmingham).

HENRY VAL. GRANTHAM.
JAMES W. KIMBER.
THOMAS RIGBY.

Having thus passed in brief review the principal arrangements of the Showyard and incidents of the Meeting, I now take my leave; that I do so with regret cannot be surprising to any one acquainted with those gentlemen with whom it has been my privilege to be associated during my term of office. It is, however, a matter of satisfaction to me that my official career should terminate in a year, which, with one exception, is marked as the most successful, numerically and financially, in the annals of the Royal Agricultural Society of England.

August, 1876.

Royal Agricultural Society of England.

1876.

President.

LORD CHESHAM.

Trustees.

Year when Elected.	
1855	Acland, Sir Thomas Dyke, Bart., M.P., *Sprydoncote, Exeter, Devonshire.*
1857	Bridport, Viscount, *Cricket St. Thomas, Chard, Somersetshire.*
1850	Chesham, Lord, *Latimer, Chesham, Bucks.*
1861	Dent, J. D., *Ribston Hall, Wetherby, Yorkshire.*
1863	Kingscote, Colonel, M.P., *Kingscote, Wotton-under-Edge, Gloucestershire.*
1868	Lichfield, Earl of, *Shugborough, Staffordshire.*
1854	Macdonald, Sir Archibald Keppel, Bt., *Woolmer Lodge, Liphook, Hants.*
1860	Marlborough, Duke of, K.G., *Blenheim Park, Oxford.*
1846	Milward, Richard, *Thurgarton Priory, Southwell, Notts.*
1839	Portman, Viscount, *Bryanston, Blandford, Dorset.*
1856	Powis, Earl of, *Powis Castle, Welshpool, Montgomeryshire.*
1858	Rutland, Duke of, K.G., *Belvoir Castle, Grantham, Leicestershire.*

Vice-Presidents.

1873	Bedford, Duke of, *Woburn Abbey, Bedfordshire.*
1861	Cathcart, Earl, *Thornton-le-Street, Thirsk, Yorkshire.*
1839	Chichester, Earl of, *Stanmer Park, Lewes, Sussex.*
1867	Devonshire, Duke of, K.G., *Holker Hall, Lancashire.*
1847	Eversley, Viscount, *Heckfield Place, Winchfield, Hants.*
1848	Gibbs, B. T. Brandreth, *Halfmoon Street, Piccadilly, London,* W.
1858	Kerrison, Sir Edward C., Bart., *Brome Hall, Scole, Suffolk.*
1839	Miles, Sir William, Bart., *Leigh Court, Bristol, Somersetshire.*
1852	Richmond and Gordon, Duke of, K.G., *Goodwood, Chichester, Sussex.*
1859	Vernon, Lord, *Sudbury Hall, Derby.*
1861	Wells, William, *Holmewood, Peterborough, Northamptonshire.*
1855	Wynn, Sir Watkin Williams, Bart., M.P., *Wynnstay, Ruabon, Denbighshire.*

Other Members of Council.

1858	*Amos, Charles Edwards, 5, *Cedars Road, Clapham Common, Surrey.*
1875	Aveling, Thomas, *Rochester, Kent.*
1875	Aylmer, Hugh, *West Dereham, Stoke Ferry, Norfolk.*
1848	Barnett, Charles, *Stratton Park, Biggleswade, Bedfordshire.*
1868	*Booth, Thomas Christopher, *Warlaby, Northallerton, Yorkshire.*
1863	*Bowly, Edward, *Siddington House, Cirencester, Gloucestershire.*
1861	Cantrell, Charles S., *Riding Court, Datchet, Bucks.*
1866	*Davies, David Reynolds, *Agden Hall, Lymm, Cheshire.*
1860	*Druce, Joseph, *Eynsham, Oxford.*
1868	*Edmonds, William John. *Southrope, Lechlade, Gloucestershire.*
1871	*Egerton, Hon. Wilbraham, M.P., *Rostherne Manor, Knutsford, Cheshire.*
1867	Eslington, Lord, M.P., *Ravensworth Castle, Durham.*

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* Those Members of Council whose names are prefixed by an asterisk retire by rotation in July, but are eligible for re-election in May.

Year when Elected.	
1873	Evans, John, _Uffington, Shrewsbury, Salop._
1875	*Frankish, William, _Limber Magna, Ulceby, Lincolnshire._
1874	*Hemsley, John, _Shelton, Newark, Notts._
1873	*Horley, Thomas, Jun., _The Fosse, Leamington, Warwickshire._
1866	*Hornsby, Richard, _Spittle Gate, Grantham, Lincolnshire._
1854	*Hoskyns, Chandos Wren, _Harewood, Ross, Herefordshire._
1871	Jones, J. Bowen, _Ensdon House, Shrewsbury, Salop._
1848	*Lawes, John Bennet, _Rothamsted, St. Albans, Herts._
1869	Leeds, Robert, _Wicken Farm, Castleacre, Brandon, Norfolk._
1872	*Leicester, Earl of, K G., _Holkham Hall, Wells, Norfolk._
1874	*Lindsay, Colonel Loyd, M.P., _Lockinge Park, Wantage, Berkshire._
1865	Lopes, Sir Massey, Bart., M.P., _Maristow, Roborough, Devon._
1871	MacIntosh, David, _Havering Park, Romford, Essex._
1874	Martin, Joseph, _Highfield House, Littleport, Isle of Ely, Cambridgeshire._
1871	*Masfen, R. Hanbury, _Pendeford, Wolverhampton, Staffordshire._
1875	*Musgrave, Sir R. C., Bart., _Edenhall, Penrith, Cumberland._
1857	Pain, Thomas, _The Grove, Basingstoke, Hants._
1874	Pole-Gell, H. Chandos, _Hopton Hall, Wirksworth, Derbyshire._
1861	*Randell, Charles, _Chadbury, Evesham, Worcestershire._
1875	Ransome, Robert Charles, _Ipswich, Suffolk._
1871	*Rawlence, James, _Bulbridge, Wilton, Salisbury, Wilts._
1869	Ridley, M. White, M.P., _Blagdon, Cramlington, Northumberland._
1861	Rigden, William, _Hove, Brighton, Sussex._
1875	Russell, Robert, _Farningham, Dartford._
1874	*Sanday, George Henry, _Wensley House, Bedale, Yorkshire._
1856	*Shuttleworth, Joseph, _Hartsholme Hall, Lincoln._
1872	Skelmersdale, Lord, _Lathom Hall, Ormskirk, Lancashire._
1874	Spencer, Earl, K.G., _Althorp, Northampton._
1875	*Stratton, Richard, _The Duffryn, Newport, Monmouthshire._
1873	Torr, John, M.P., _Carlett Park, Eastham, Chester._
1874	*Turbervill, Major Picton, _Ewenny Priory, Bridgend, South Wales._
1845	Turner, George, _Brampford Speke, Exeter, Devonshire._
1871	Turner, Jabez, _Haddon, Yaxley, Huntingdonshire._
1871	Wakefield, William H., _Kendal, Westmoreland._
1870	*Welby-Gregory, Sir William Earle, Bart., M.P., _Newton House, Folkingham, Lincolnshire._
1870	*Whitehead, Charles, _Barming House, Maidstone, Kent._
1865	Wilson, Jacob, _Woodhorn Manor, Morpeth, Northumberland._

Secretary and Editor.

H. M. JENKINS, 12, _Hanover Square, London_, W.

Consulting Chemist—Dr. Augustus Voelcker, F.R.S., 11, _Salisbury Square_, E.C.
Consulting Botanist—W. Carruthers, F.R.S., F.L.S., _British Museum_, W.C.
Consulting Veterinary Surgeon—Dr. J. Burdon Sanderson, F.R.S., _Brown Institution, Wandsworth Road_, S.W.
Consulting Engineers—Eastons & Anderson, _The Grove, Southwark Street_, S.E.
Seedsmen—Thomas Gibbs and Co., _Corner of Halfmoon Street, Piccadilly_, W.
Publisher—John Murray, 50, _Albemarle Street_, W.
Bankers—The London and Westminster Bank, _St. James's Square Branch_, S.W.

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* Those members of Council whose names are prefixed by an asterisk retire by rotation in July, but are eligible for re-election in May.

STANDING COMMITTEES FOR 1876.

Finance Committee.

Kingscote, Colonel (Chairman).
Bridport, Viscount.
Booth, T. C.
Randell, Charles.
Shuttleworth, J.

House Committee.

The President.
Chairman of Finance Committee.
Bridport, Viscount.
Cantrell, C. S.
Gibbs, B. T. Brandreth.

Journal Committee.

Dent, J. D. (Chairman).
Cathcart, Earl.
Spencer, Earl.
Vernon, Lord.
Hemsley, J.
Hoskyns, C. Wren.
Jones, J. Bowen.
Kingscote, Colonel.
Milward, Richard.
Ridley, M. White.
Welby-Gregory, Sir W. E., Bt.
Wells, W.
Whitehead, Charles.

Chemical Committee.

Wells, William (Chairman).
Bedford, Duke of.
Lichfield, Earl of.
Vernon, Lord.
Dent, J. D.
Hoskyns, C. Wren.
Jones, J. Bowen.
Lawes, J. B.
Martin, J.
Randell, C.
Russell, R.
Voelcker, Dr. A.
Wakefield, W. H.
Welby-Gregory, Sir W. E., Bt.
Whitehead, Charles.
Wilson, Jacob.

Botanical Committee.

Whitehead, Charles (Chairman).
Eslington, Lord.
Vernon, Lord.
Edmonds, W. J.
Frankish, W.
Gibbs, B. T. Brandreth.
Jones, J. Bowen.
Musgrave, Sir R.
Russell, R.
Turner, Jabez.
Voelcker, Dr.
Wells, W.

Veterinary Committee.

Egerton, Hon. Wilbraham (Chairman).
Bridport, Viscount.
Cathcart, Earl.
Booth, T. C.
Brown, Professor.
Carpenter, Dr.
Duguid, W.
Gibbs, B T. Brandreth.
Kingscote, Colonel.
Lindsay, Colonel Loyd.
Milward, R.
Pole-Gell, H. Chandos.
Quain, Dr.
Ridley, M. White
Sanderson, Dr. J. Burdon.
Simonds, Professor.
Wells, William.
Wilson, Jacob.

Stock-Prizes Committee.

Milward, Richard (Chairman).
Bridport, Viscount.
Aylmer, H.
Booth, T. C.
Bowly, Edward.
Dent, J. D.
Druce, Joseph.
Evans, John.
Gibbs, B. T. Brandreth.
Hemsley, J.
Horley, Thomas.
Leeds, Robert.
Lindsay, Colonel Loyd.
MacIntosh, D.
Martin, J.
Masfen, R. H.
Pain, T.
Pole-Gell, H. Chandos.
Randell, Charles.
Ridley, M. White.
Rigden, William.
Sanday, G. H.
Stratton, R.
Turner, George.
Wakefield, W. H.
Wilson, Jacob.
The Stewards of Live Stock.

Implement Committee.

Bridport, Viscount.
Vernon, Lord.
Amos, C. E.
Aveling, T.
Booth, T. C.
Cantrell, Chas. S.
Edmonds, W. J.
Evans, John.
Gibbs, B. T. Brandreth.
Hemsley, J.
Horley, T.
Hornsby, Richard.
Hoskyns, C. Wren.
Jones, J. Bowen.
Leeds, Robert.
Martin, J.
Masfen, R. H.
Milward, R.
Randell, Charles.
Sanday, G. H.
Shuttleworth, Joseph.
Turner, Jabez.
Welby-Gregory, Sir W. Earle, Bart.
Whitehead, Charles.
Wilson, Jacob.
The Stewards of Implements.

General Birmingham Committee.

Bridport, Viscount (Chairman).
Chesham, Lord.
Bedford, Duke of.
Cathcart, Earl.
Powis, Earl of.
Leigh, Lord.
Vernon, Lord.
Wynn, Sir Watkin W., Bart.
Birmingham, the Deputy Mayor of.
Aylmer, H.
Booth, T. C.
Bowly, Edward.
Caldecott, C. M.
Cantrell, Charles S.
Druce, Joseph.
Edmonds, W. J.
Frankish, W.
Gibbs, B. T. Brandreth.
Hemsley, J.
Horley, T., Jun.
Hornsby, Richard.
Hoskyns, C. Wren.
Jaffray, J.
Jones, J. Bowen.
Leeds, Robert.
Lowe, John.
Lythall, J. B.
Martin, J.
Masfen, R. H.
Milward, Richard.
Pole-Gell, H. C.
Randell, Charles.
Ridley, M. W.
Shuttleworth, J.
Turner, G.
Turner, Jabez.
Wakefield, W. H.
Whitehead, Charles.
Wilson, Jacob.
Wise, G.

Show-Yard Contracts Committee.

Randell, Charles (Chairman).
Bridport, Viscount.
Vernon, Lord.
Amos, C. E.
Booth, T. C.
Frankish, W.
Horley, T.
Hornsby, Richard.
Milward, Richard.
Shuttleworth, Joseph.
Wilson, Jacob.

Committee of Selection.

Cathcart, Earl.
Bridport, Viscount.
Egerton, Hon. W.
Randell, Charles.
Welby-Gregory, Sir W. E., Bt.
Wilson, Jacob.

And the Chairmen of the Standing Committees.

Education Committee.

Bedford, Duke of (Chairman).
Dent, J. D.
Jones, J. Bowen.
Kingscote, Colonel.
MacIntosh, David.
Turberville, Major P.
Voelcker, Dr.
Wells, William.
Whitehead, Charles.

Cattle Plague Committee.

The whole Council.

⁂ The President, Trustees, and Vice-Presidents are Members *ex officio* of all Committees.

Royal Agricultural Society of England.

GENERAL MEETING,

12, Hanover Square, Thursday, December 9th, 1875.

REPORT OF THE COUNCIL.

The Council of the Royal Agricultural Society have to report that, during the year 1875, the number of Governors and Members has been increased by the election of 34 Governors and 672 Members, and diminished by the death of 9 Governors and 124 Members, the resignation of 115 Members, and the removal of 25 Members by order of the Council.

The Society now consists of:—

83	Life Governors,
78	Annual Governors,
2133	Life Members,
4096	Annual Members,
11	Honorary Members,

making a total of 6401, and showing an increase of 419 Members since this time last year.

The vacancy in the list of Trustees, caused by the death of Lord Tredegar, reported at the General Meeting in May, has been filled up by the election of the Earl of Lichfield, while the representation of Monmouthshire on the Council has been again secured by the election of Mr. Richard Stratton, of The Duffryn, near Newport. The Council have also filled up the vacancy caused by the regretted death of Lieut.-Col. Wilson, M.P., by the election of Mr. Robert Charles Ransome, of Orwell Works, Ipswich.

The half-yearly statement of accounts to the 30th June, 1875, has been examined and approved by the Society's auditors and accountants, and has been published for the information of the Members in the last number of the 'Journal.' The funded capital has since then been reduced by the sum of 3000*l.* New Three per Cents., which have been sold out to meet the deficiency in the receipts at the Taunton Meeting. The funded property of the Society is now 18,112*l.* 7*s.* 8*d.* New Three per Cents., and the balance in the hands of the bankers on the 1st instant was 699*l.* 17*s.* 3*d.*

The Taunton Meeting was characteristic of the year 1875, which will endure in the remembrance of farmers and townsmen alike as the period of a succession of disastrous floods. The Society has naturally experienced a loss of some magnitude; but the important accession made to the list of Members during the year has enabled the Council to meet the deficiency of the receipts at Taunton without any larger drain upon the Funded capital of the Society than was entailed by the Bedford Meeting last year. It is also satisfactory to know that the visit of the Society to so distant a town in the West of England was thoroughly appreciated. Indeed, judging from the exertions made by the authorities and inhabitants of the town to give the Society a hearty welcome, and from the numbers who visited the Showyard on the only fine day of the week, there is ground for believing that, with a continuance of fine weather, the Taunton Meeting would not have affected the funds of the Society to any serious extent, while the amount of information which would have been disseminated would necessarily have been very largely increased.

The trials of Mowing-machines at Taunton excited the greatest interest amongst the competitors and the public, and the prizes were competed for by a larger number of manufacturers, both English and American, than on any previous occasion. A descriptive and illustrated report of the Trials, for which the Society is indebted to Mr. Hemsley, one of the Stewards, has been published in the last number of the 'Journal;' and the Consulting Engineers have, as usual, rendered it more comprehensive and valuable by carefully compiled tables showing the results of the trials from a mechanical point of view.

The exhibition of Live Stock at Taunton was naturally not so extensive as that which is seen when the Country Meeting is held in a more central locality; but it may be said that all the standard national breeds were fairly represented, and that most of the prizes fell to well-known exhibitors. On the other hand, the competition for the prizes offered for local breeds, both of sheep and ponies, was particularly small, the only exceptions being in the classes for Devon Long-wools.

The nature of the competition for the prizes offered for the best-managed farms in the county of Somerset, has been already reported to the Society, which is much indebted to Mr. J. Bowen Jones, a Member of the Council and one of the Judges, for a Report containing a very full and interesting description of the farms to which the prizes were awarded, as well as notices of some of the others which competed. This Report has also been published in the last number of the 'Journal.'

The prospects of the Country Meeting to be held next year at Aston Park, Birmingham, are unusually encouraging. The Local Committee have very liberally added to the Society's Prize-sheet offers of prizes for Agricultural horses, hunters, hacks, and harness-horses; Long-horn and dairy cattle; Shropshire sheep, wool, butter, and cheese, amounting in the aggregate to 1010*l.* These prizes, added to those offered by the Society, raise the total amount of prizes for Live Stock to be competed for at Birmingham to the large sum of 4305*l.*

The Birmingham Local Committee have also offered two prizes of 100*l.* and 50*l.* respectively for the best-managed farms in Warwickshire exceeding 200 acres in extent; and prizes of 50*l.* and 25*l.* respectively for the best-managed farms in the county not exceeding 200 acres; and they have further placed a sum of 25*l.* at the disposal of the Judges for the recognition of special merit in any of the competing farms. The Council regret to say that, notwithstanding the liberality of these prizes, the entries this year are restricted to five in the large-farm class, there being no entry in the class for farms not exceeding 200 acres.

The Council have resolved that the Birmingham Meeting shall commence on Wednesday, July 19th, instead of Monday as heretofore. They have also resolved that any exhibitor wishing to remove his horse for the night be allowed to do so, on depositing 10*l.* at the Secretary's office, and receiving an official pass—the time of leaving, and that of returning next morning, to be inserted thereon; and if the animal be not duly brought back, the sum of 10*l.* shall be forfeited to the Society for each Show-day the animal is absent; and the exhibitor shall also forfeit any prize awarded to him in any class at the Birmingham Show, and shall not exhibit again at the Society's Shows until the forfeits are paid.

With regard to the ages of pigs entered in the classes for "three breeding sow-pigs of the same litter," which have hitherto been fixed at over four and not exceeding eight months old, the Council have resolved that in future the limits of age shall be over three and not exceeding six months old. The regulation of the Prize-sheet prohibiting the preparation of sheep for show by oiling and colouring has been cancelled.

The prizes for implements, offered for competition next year, are confined to Reaping-machines and Sheaf-binders. The competing implements will be tried at harvest-time, and probably in the county of Warwick, upon suitable crops which will be engaged for the purpose; and it is confidently expected that the interest attaching to these trials will rival that which was exhibited during the trials of Mowing-machines at Taunton.

During the past half-year the attention of the Council has been much occupied by a revision of the Society's Bye-laws; and after prolonged consideration, and repeated recourse to legal authorities, they have adopted a revised code of Bye-laws in conformity with the provisions of the Charter, which they hope will tend to increase the interest of Members in the Society, especially in the exercise of their function as the electors of the Council at the Annual Meetings in May. A copy of these Bye-laws will be sent to each Member of the Society, whose subscription is not in arrear, with his copy of the next number of the 'Journal.'

The Council have also had under discussion the relations existing between the Royal Veterinary College and the Society; and the Veterinary Committee have had an interview with a deputation of the Governors of the College with a view to arrange matters on a more satisfactory basis than heretofore. The Council regret that they have been unable to come to any other opinion than that the proposals of the Royal Veterinary College did not sufficiently meet the requirements of the Society. They have, therefore, given notice to the Governors that the annual grant made by the Council to the Royal Veterinary College will be discontinued from and after the 31st December, 1875.

The future organization of the Veterinary Department of the Society has also been carefully considered by the Council. As a basis, they resolved that the annual grant for veterinary purposes should be devoted as follows:—

1st. To giving Members of the Society the opportunity of obtaining the best veterinary advice in the case of any extensive or serious outbreak of disease.

2nd. To provide for experiments being made in the treatment of diseases.

3rd. To the scientific investigation of the causes and nature of diseases of animals belonging to the farm.

The Council then communicated with the Committees of the Royal Agricultural College and the Brown Institution, the latter being an establishment in London, governed by a Committee of the Senate of the University of London, which was founded for the purpose of facilitating investigations into the diseases of animals useful to man. After considering the report of a meeting between the Veterinary Committee and the Committee of the Brown Institution, the Council have resolved to place a sum not exceeding 500*l.* for the year 1876 at the disposal of the Veterinary Committee for general Veterinary purposes, and for special scientific inquiries into pleuro-pneumonia and foot-and-mouth disease, to be carried out by Dr. Burdon Sanderson, the Professor-Superintendent of that Institution. The Veterinary Assistant of the Institution will also be authorized to act as the Society's Veterinary Inspector, in cases where Members of the Society require Veterinary aid, on the same terms as have hitherto been paid to the Professors of the Royal Veterinary College.

The past autumn has again been characterised by an extensive outbreak of foot-and-mouth disease, which was doubtless the result of causes that are every year in operation at that season, when farmers generally are buying in their winter supply of store-cattle. These cattle in many cases have been in contact with affected beasts, either, in fields, lairs, trucks, or steamboats, or upon markets; and have thus been made vehicles for the dissemination of the disease. The Council have repeatedly represented to the Government the measures which, in their opinion, are necessary to restrict the dimensions and importance of these annual outbreaks. These suggestions were framed upon the conviction that the outbreaks are mainly brought about by the movement of animals during the autumn, being from fair to fair, and so from fairs to farms, instead of, as at other seasons, from farm to slaughter-house. The scientific knowledge of this disease and of pleuro-pneumonia appears to the Council so imperfect, that they have thought it desirable to initiate further inquiries as to their physiological character, in the hope thereby to guide their own Members and the officials of Government in carrying out both preventive and curative measures.

The past Parliamentary Session has witnessed the passing of The Agricultural Holdings (England) Act, 1875—a legislative enactment of great importance to English agriculture. The Council intend to publish this Act in the next number of the 'Journal,' with an analysis and explanation; and has under its consideration, by what means reliable data can be obtained for the guidance of valuers under the Act, in reference to unexhausted improvements of the third class.

Twenty-two candidates from five schools were entered to compete for the Society's Junior Scholarships, and the examinations of the candidates were held at the schools on November 16th and 17th. The following Scholarships have been awarded, the names being given in the order of merit:—

W. H. Richmond,
H. Nichols, } Surrey County School.
A. W. Plant,
J. Stubbs, Bedford County School.
T. Stone, Devon County School.
J. Carmichael, Surrey County School.
J. Watson, Albert Institution, Glasnevin.
W. Gardiner, Bedford County School.
R. E. Mills,
W. E. Barton, } Surrey County School.

The Council are of opinion that the step which they took last year in offering these Junior Scholarships had already met with very satisfactory support; and they have accordingly renewed the grant for the year 1876.

By order of the Council,

H. M. JENKINS,

Secretary.

MEMORANDA.

Address of Letters.—The Society's office being situated in the postal district designated by the letter W, members, in their correspondence with the Secretary, are requested to subjoin that letter to the usual address.

General Meeting in London, May 22, 1876, at 12 o'clock.

Meeting at Birmingham, July 19th, 1876, and four following days (Sunday excepted).

General Meeting in London, December, 1876.

Monthly Council (for transaction of business), at 12 o'clock on the first Wednesday in every month, excepting January, September, and October: open only to Members of Council and Governors of the Society.

Adjournments.—The Council adjourn over Passion and Easter weeks, when those weeks do not include the first Wednesday of the month; from the first Wednesday in August to the first Wednesday in November; and from the first Wednesday in December to the first Wednesday in February.

Office Hours.—10 to 4. On Saturdays, 10 to 2.

Diseases of Cattle, Sheep, and Pigs.—Members have the privilege of applying to the Veterinary Committee of the Society, and of sending animals to the Brown Institution, Wandsworth Road, S.W.—(A statement of these privileges will be found in this Appendix.)

Chemical Analysis.—The privileges of Chemical Analysis enjoyed by Members of the Society will be found stated in this Appendix.

Botanical Privileges.—The Botanical Privileges enjoyed by Members of the Society will be found stated in this Appendix.

Subscriptions.—1. Annual.—The subscription of a Governor is £5, and that of a Member £1, due in advance on the 1st of January of each year, and becoming in arrear if unpaid by the 1st of June. 2. For Life.—Governors may compound for their subscription for future years by paying at once the sum of £50, and Members by paying £10. Governors and Members who have paid their annual subscription for 20 years or upwards, and whose subscriptions are not in arrear, may compound for future annual subscriptions, that of the current year inclusive, by a single payment of £25 for a Governor, and £5 for a Member.

Payments.—Subscriptions may be paid to the Secretary, in the most direct and satisfactory manner either at the Office of the Society, No. 12, Hanover Square, London, W., or by means of post-office orders, to be obtained at any of the principal post offices throughout the kingdom, and made payable to him at the Vere Street Office, London, W.; but any cheque on a banker's or any other house of business in London will be equally available, if made payable on demand. In obtaining post-office orders care should be taken to give the postmaster the correct initials and surname of the Secretary of the Society (H. M. Jenkins), otherwise the payment will be refused to him at the post-office on which such order has been obtained; and when remitting the money-orders it should be stated by whom, and on whose account, they are sent. Cheques should be made payable as drafts on demand (not as bills only payable after sight or a certain number of days after date), and should be drawn on a London (not on a local country) banker. When payment is made to the London and Westminster Bank, St. James's Square Branch, as the bankers of the Society, it will be desirable that the Secretary should be advised by letter of such payment, in order that the entry in the banker's book may be at once identified, and the amount posted to the credit of the proper party. No coin can be remitted by post, unless the letter be registered.

New Members.—Every candidate for admission into the Society must be proposed by a Member; the proposer to specify in writing the full name, usual place of residence, and post-town, of the candidate, either at a Council meeting, or by letter addressed to the Secretary. Forms of Proposal may be obtained on application to the Secretary.

⁂ Members may obtain on application to the Secretary copies of an Abstract of the Charter and Bye-laws, of a Statement of the General Objects, &c., of the Society, of Chemical, Botanical, and Veterinary Privileges, and of other printed papers connected with special departments of the Society's business.

Royal Agricultural Society of England.

1876.

DISTRIBUTION OF MEMBERS OF THE SOCIETY AND OF MEMBERS OF COUNCIL.

Districts.	Counties.	Number of Members.	Number in Council.	Members of Council.
A.	Durham	95	1	Lord Eslington.
	Northumberland	127	2	M. White Ridley; Jacob Wilson.
	Yorkshire—North and East Ridings	193	3	Earl Cathcart v.p.; T. C. Booth G. H. Sanday.
		415	6	
B.	Bedfordshire	74	2	Duke of Bedford, v.p.; C. Barnett.
	Cambridgeshire	91	1	J. Martin.
	Essex	125	1	D. McIntosh.
	Hertfordshire	116	1	J. B. Lawes.
	Huntingdonshire	45	2	Jabez Turner; W. Wells, v.p.
	Norfolk	237	3	Earl of Leicester; Robert Leeds; Hugh Aylmer.
	Suffolk	150	1	Sir E. C. Kerrison, v.p.
		838	11	
C.	Cornwall	43		
	Devonshire	110	3	Sir T. D. Acland, t.; Sir M. Lopes; G. Turner.
	Dorsetshire	64	1	Lord Portman, t.
	Somersetshire	142	2	Viscount Bridport, t.; Sir W. Miles, v.p.
	Wiltshire	103	1	J. Rawlence.
		462	7	
D.	Derbyshire	105	2	Lord Vernon, v.p.; H. Chandos Pole-Gell.
	Leicestershire	105	1	Duke of Rutland, t.
	Lincolnshire	216	3	W. Frankish; Sir W. Earle Welby-Gregory; J. Shuttleworth.
	Northamptonshire	116	1	Earl Spencer.
	Nottinghamshire	137	2	R. Milward, t.; J. Hemsley.
	Rutland	15		
	Warwickshire	176	1	T. Horley, jun.
		870	10	

DISTRIBUTION OF MEMBERS OF THE SOCIETY—*continued.*

Districts	Counties	Number of Members.	Number in Council.	Members of Council.
E.	Cumberland	105	1	Sir R. C. Musgrave.
	Lancashire	230	2	Duke of Devonshire, V.P.; Lord Skelmersdale.
	Westmoreland	64	1	W. H. Wakefield.
	Yorkshire — West Riding	144	1	J. D. Dent, T.
		543	5	
F.	Gloucestershire	202	3	E. Bowly; W. J. Edmonds; Col. Kingscote, T.
	Herefordshire	93	1	C. Wren Hoskyns.
	Monmouthshire	55	1	R. Stratton.
	Worcestershire	145	1	C. Randell.
	South Wales	143	1	Major P. Turbervill.
		638	7	
G.	Berkshire	129	1	Colonel Loyd Lindsay.
	Buckinghamshire	69	2	Lord Chesham, T.; C. S. Cantrell.
	Hampshire	141	3	Viscount Eversley, V.P.; Sir A. K. Macdonald, T.; T. Pain.
	Kent	290	2	C. Whitehead; R. Russell.
	Middlesex	280	1	B. T. Brandreth Gibbs, V.P.
	Oxfordshire	142	2	Duke of Marlborough, T.; J. Druce.
	Surrey	123	1	C. E. Amos.
	Sussex	134	3	Earl of Chichester, V.P.; Duke of Richmond and Gordon, V.P.; W. Rigden.
		1308	15	
H.	Cheshire	160	3	D. R. Davies; Hon. W. Egerton; John Torr.
	Shropshire	336	2	John Evans; J. B. Jones.
	Staffordshire	326	2	Earl of Lichfield, T.; R. H. Masfen.
	North Wales	128	2	Earl of Powis, T.; Sir W. Wynn, V.P.
		950	9	
Scotland		71		
Ireland		82		
Channel Islands		11		
Foreign Countries		83		
Members without Addresses		80		
		327		

Implement Makers.

T. Aveling.
R. Hornsby.
R. C. Ransome.

ROYAL AGRICULTURAL

Dr.

HALF-YEARLY CASH ACCOUNT

	£.	s.	d.	£	s.	d.	£	s.	d.
To Balance in hand, 1st July, 1875:—									
Bankers	2,346	5	7						
Secretary	9	13	6						
				2,355	19	1			
At Deposit				1,500	0	0			
							3,855	19	1
To Income:—									
Subscriptions:—									
Governors' Life-Compositions	120	0	0						
Governors' Annual	25	0	0						
Members' Life-Compositions	409	0	0						
Members' Annual	749	0	0						
				1,303	0	0			
Dividends on Stock				269	8	5			
Interest on Deposit				23	11	8			
Journal:—									
Sales	90	9	5						
Advertisements	129	2	8						
				219	12	1			
Farm Inspection:—									
Entry Fees for 1876				12	0	0			
Potatoe Experiments:—									
Potatoes Sold				65	9	0			
Bedford Meeting				63	2	6			
Total Income							1,956	3	8
To Capital:—									
Sale of Country Meeting Plant				23	18	10			
To Stock:—									
Sale of 3000*l.* New 3 per Cent.				2,838	15	0			
To Taunton Meeting				5,238	6	11			
							8,101	0	9
							£13,913	3	6

BALANCE-SHEET,

LIABILITIES.	£	s.	d.	£	s.	d.	£	s.	d.
To Capital:—									
Surplus, 30th June, 1875				26,661	3	2			
Less Surplus of Expenditure over Income during the Half-year, viz.:—									
Expenditure	2,840	3	8						
Income	1,956	3	8						
	893	0	0						
Less half-year's interest and depreciation on Country Meeting Plant	197	17	6						
				1,090	17	6			
							25,570	5	8
To Taunton Meeting:—									
Excess of Expenditure over Receipts				..	..	..	4,248	4	9
							£21,322	0	11

QUILTER, BALL, & CO., *Accountants.*

SOCIETY OF ENGLAND.

FROM 1ST JULY TO 31ST DECEMBER, 1875. CR.

	£ s. d.	£ s. d.	£ s. d.
By Expenditure:—			
Establishment:—			
Salaries, Wages, &c.	527 10 0		
House:—Rent, Taxes, Repairs, &c.	311 18 3		
Office:—Printing, Postage, Stationery, &c.	177 12 0		
		1,017 0 3	
Journal:—			
Printing and Stitching	534 2 3		
Postage and Delivery	140 0 0		
Literary Contributions	128 4 3		
Woodcuts	71 5 6		
Lithographing	29 4 0		
Advertising	5 18 3		
		908 14 3	
Chemical:—			
Consulting Chemist's Salary		150 0 0	
Veterinary:—			
Royal Veterinary College, Half-year to June 30, 1875	100 0 0		
Experiment	25 0 0		
		125 0 0	
Botanical:—			
Consulting Botanist's Salary		50 0 0	
Education:—			
Printing, Advertising, &c.	8 4 6		
Scholarships	60 0 0		
		68 4 6	
Farm Inspection:—			
Prizes	200 0 0		
Judges	213 1 2		
Printing and Advertising for 1876	30 16 6		
		443 17 8	
Sundries:—			
Illuminating Vote of Thanks to Mr. Gibbs		40 15 6	
Stock:—			
Expenses of Sale		0 11 6	
Bedford Meeting		45 0 0	
Total Expenditure		.. .. ..	2,849 3 8
By Capital Account:—			
Country Meeting Plant		40 17 5	
By Country Meetings:—			
Taunton	10,706 7 10		
Birmingham	87 19 6		
		10,794 7 4	
			10,835 4 9
By Balance in hand, 31st December.—			
Bankers		179 9 9	
Secretary		49 5 4	
			228 15 1
			£13,913 3 6

31ST DECEMBER, 1875.

ASSETS.	£ s. d.	£ s. d.
By Cash in hand	228 15 1	
By New 3 per Cent. Stock 18,112*l.* 7*s.* 8*d.* cost*	17,340 7 1	
By Books and Furniture in Society's House	1,451 17 6	
By Country Meeting Plant	2,213 1 9	
		21,234 1 5
By Birmingham Meeting (Balance)	.. .. ..	87 19 6
		£21,322 0 11

* *Value at* 94½ = £17,044 7*s.* 6*d.*

Mem.—The above Assets are exclusive of the amount recoverable in respect of arrears of Subscription to 31st Dec., 1875, which at that date amounted to 694*l.*

Examined, audited, and found correct, this 7th day of February, 1876.

FRANCIS SHERBORN,
A. H. JOHNSON,
HENRY CANTRELL.
} *Auditors on behalf of the Society.*

ROYAL AGRICULTURAL

Dr. YEARLY CASH ACCOUNT,

	£.	s.	d.	£.	s.	d.	£.	s.	d.
To Balance in hand, 1st Jan. 1875.—									
Bankers	. .			514	0	9			
Secretary	. .			22	0	0			
							536	0	9
To Income:—									
Subscriptions:—									
Governors' Life-Compositions	400	0	0						
Governors' Annual	350	0	0						
Members' Life-Compositions	1,619	0	0						
Members' Annual	3,895	17	0						
				6,264	17	0			
Dividends on Stock	. .			583	9	4			
Interest on Deposit Account	. .			23	11	8			
Journal:—									
Sales	90	13	5						
Advertisements	129	2	8						
				219	16	1			
Farm-Inspection:—									
Entry Fees for 1876	. .			12	0	0			
Potato Disease Investigations:—									
Sale of Potatoes	. .			84	17	0			
Total Income	. .						7,188	11	1
To Country Meetings:—									
Hull	. .			2	10	0			
Bedford	. .			116	16	6			
Taunton	. .			9,494	0	9			
							9,613	7	3
To Capital:—									
Sale of Country Meeting Plant	. .			. .			23	18	10
To Stock:									
Sale of £3000 New 3 Per Cents.	. .			. .			2,838	15	0
							£20,200	12	11

SOCIETY OF ENGLAND.

FROM 1ST JANUARY TO 31ST DECEMBER, 1875. CR.

	£. s. d.	£. s. d.	£. s. d.
By Expenditure :—			
Establishment:—			
Salaries, Wages, &c.	1,060 0 0		
House: Rent, Taxes, Repairs, &c.	554 18 9		
Office: Printing, Postage, &c.	398 2 5		
		2,013 1 2	
Journal :—			
Printing and Stitching	1,054 18 2		
Postage and Delivery	327 0 0		
Literary Contributions	278 4 3		
Wood Engravings	102 11 0		
Lithographing	29 4 0		
Advertising	5 18 3		
Printing Index	189 2 11		
Compiling ditto	35 0 0		
Wrappers for three deliveries	33 10 0		
		2,055 8 7	
Chemical:—			
Consulting Chemist's Salary	300 0 0		
Grant for Investigations	200 0 0		
		500 0 0	
Veterinary:—			
Grant to Royal Veterinary College, 1½ year	300 0 0		
Grant for Experiments	25 0 0		
		325 0 0	
Botanical :—			
Consulting Botanist's Salary	. .	100 0 0	
Education :—			
Scholarships	60 0 0		
Prizes	40 0 0		
Fees to Examiners.	52 10 0		
Advertising and Printing.	34 6 6		
		186 16 6	
Sundries :—			
Law Costs	54 1 6		
Expenses of Inspection Committee	12 2 9		
Illuminating Vote of Thanks to Mr. Gibbs	40 15 6		
		106 19 9	
Farm Inspection:—			
Prizes	200 0 0		
Judges	213 1 2		
Printing and Advertising for 1876	30 16 6		
		443 17 8	
Potato Disease Investigations	. .	195 2 0	
Stock: Expenses of Sale	. .	0 11 6	
Subscriptions (paid in error) returned	. .	4 0 0	
Total Expenditure	. .		5,930 17 2
By Capital Account :—			
Country Meeting Plant	. .	190 17 5	
By Country Meetings :—			
Bedford	142 2 0		
Taunton	13,620 1 9		
Birmingham	87 19 6		
		13,850 3 3	
			14,041 0 8
By Balance in hand, 31st Dec. :—			
Bankers	. .	179 9 9	
Secretary	. .	49 5 4	
			228 15 1
			£20,200 12 11

RECEIPTS.

	£.	s.	d.
Subscription from Taunton	1,500	0	0
Admissions to Show Yard by Payment	3,717	9	11
Admissions by Season Tickets	208	0	0
Admissions to Grand Stand	88	9	0
Sale of Catalogues	341	11	9
Entries in Implement Catalogue	250	0	0
Implement Exhibitors' Payments for Shedding	1,790	4	4
Non-Members' Fees for entry of Implements	156	0	0
Fees for entry of Live Stock	488	0	0
Fees for Horse Boxes and Stalls	181	0	0
Premiums for Supply of Refreshments	425	0	0
Premium for Manure	15	0	0
Premium for Cloak Rooms and Lavatories	50	0	0
Fines for Non-Exhibition	55	0	0
Reference Number Fines	8	10	0
	9,274	5	0
Balance of Expenditure over Receipts	4,576	12	0
	£13,850	17	0

ACCOUNT, TAUNTON, 1875.

EXPENDITURE.

	£.	s.	d	£.	s.	d.
Show Yard Works:—viz. Carriage, Storage, Erecting and Painting, taking to pieces, Packing and Insurance of Permanent Buildings, and other Plant	646	3	9			
Implement Sheds, 1130*l.* 10*s.*; Seeds, &c., and Sheds, 172*l.*	1302	10	0			
Stock Sheds, 614*l.* 5*s.* 6*d.*; Horse Boxes, 711*l.* 17*s.* 10*d.*	1326	3	4			
Horse and Cattle Rings, 65*l.* 5*s.* 6*d.*; Fodder Shed, 120*l.* 2*s.* 6*d.*	185	8	0			
Fencing and Gates, 443*l.* 11*s.* 6*d.*; Hurdles, 166*l.* 5*s.*	609	16	6			
Lavatories, Closets, &c., 207*l.* 17*s.* 3*d.*; other Offices and Buildings, 67*l.* 16*s.* 6*d.*; Band Stand, 12*l.* 7*s.*	288	0	9			
Tents and Fittings, 69*l.* 16*s.* 9*d.*; Awnings, 68*l.* 2*s.* 4*d.*	137	19	1			
Platform inside Entrances, 61*l.* 5*s.* 3*d.*; Grand Stand, 118*l.* 15*s.*; Signs and Notice Boards, 91*l.* 10*s.* 4*d.*	271	10	7			
Other Works, 281*l.* 0*s.* 9*d.*; Works for Trials, 74*l.* 15*s.* 4*d.*	355	16	1			
Surveyor	198	11	3			
Depreciation of Plant	391	19	9			
				5,713	19	1
Half cost of Trial Fields				230	0	0
Judges: Implement, 171*l.* 14*s.* 6*d.*; Stock, 312*l.* 7*s.* 4*d.*; Cheese, 13*l.* 19*s.* 9*d.*				498	1	7
Consulting Engineers and Assistants				243	0	1
Inspectors: Veterinary, 62*l.* 14*s.*; Shearing, 34*l.* 14*s.* 9*d.*				97	8	9
Police: Metropolitan, 300*l.* 2*s.* 2*d.*; County, 40*l.* 16*s.* 4*d.*				340	18	6
Clerks and Assistants: Secretary and official Staff, 104*l.* 13*s.* 10*d.*; Bankers, 23*l.* 2*s.*				127	15	10
Assistant Stewards: Implements, 48*l.* 7*s.*; Stock, 22*l.* 12*s.*				70	19	0
Foremen: Trial Fields, 29*l.* 15*s.* 1*d.*; Implements, 21*l.* 4*s.* 8*d.*; Cattle, 12*l.* 18*s.* 6*d.*; Horses, 10*l.* 12*s.*; Sheep and Pigs, 5*l.* 8*s.*; Fodder, 13*l.* 15*s.*; Stockmen, 6*l.* 14*s.* 2*d.*				100	7	5
Fieldmen, Yardmen, Labourers, Grooms, &c.				229	10	3
Stewards' Expenses				152	12	10
Lodgings for Judges and other Officials				166	14	0
Refreshments				180	18	9
Catalogues: Implements, 204*l.* 16*s.* 6*d*; Awards, 3*l.* 9*s.* 6*d*; Stock, 94*l.* 18*s.* 6*d.*; Awards, 37*l.* 1*s.* 6*d.*; Plan of Yard, 20*l.*; Sellers, 22*l.* 10*s.*; Carriage and Packing, 17*l.* 16*s.*				400	12	0
Printing, 558*l.* 6*s.* 2*d.*; Advertising and Bill Posting, 476*l.* 7*s.* 6*d.*				1034	13	8
Hay, 176*l.* 18*s.* 4*d.*; Straw, 169*l.* 6*s.* 9*d.*; Green Food, 250*l.* 1*s.*; Expenses in purchasing ditto, 5*l.* 10*s.*; Insurance, 2*l.* 10*s.*				604	6	1
Wheat, 32*l.* 16*s.* 1*d.*; Spreading Straw in Yard, 10*l.*; Cutting Grass, 3*l.*				45	16	1
Postage, Carriage, Stationery, Badges, &c.				89	1	0
Repairs, Insurance, and Carriage of Testing Machinery				86	6	8
Horse Hire, 139*l.* 1*s.* 2*d.*; Carriages and Cabs, 16*l.* 1*s.*				155	2	2
Coals, 2*l.* 16*s.*; Veterinary Medicines, 1*l.* 10*s.* 6*d.*; Disinfectants, 1*l.*				5	6	6
Hire of Clock, &c., 9*l.* 3*s.*; Hire of Furniture, 2*l.* 10*s.*; Hire of Water Cans, Pitchforks, and sundry other articles, 4*l.* 15*s.* 6*d.*				16	8	6
Fire Engine Men, 15*l.*; Boys, 1*l.* 14*s.*; Mowing and removing Straw, 5*l.*				21	14	0
Journeys to Taunton previous to Show				9	3	0
Gratuities to Post-Office Officials, 5*l.*; Petty Payments, 4*l.* 3*s.* 3*d.*				9	3	3
Rosettes, 12*l.* 6*s.* 6*d.*; Medals, 3*l.* 12*s.*				15	18	6
Prizes: Stock, 2980*l.*;* Implements, 225*l.*				3,205	0	0
				£13,850	17	6

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* Exclusive of Local Prizes, 77*l.*, and 80*l.* given by E. Pease, Esq.

Birmingham Meeting, 1876.

ON WEDNESDAY THE 19TH OF JULY, AND FOUR FOLLOWING DAYS (SUNDAY EXCEPTED).

SCHEDULE OF PRIZES.

I.—LIVE-STOCK PRIZES.

*Prizes offered by the Birmingham Local Committee are marked thus *.*

Reference Number in Certificates.	HORSES.	First Prize.	Second Prize.	Third Prize.
Class	STALLIONS.	£.	£.	£.
1	Agricultural Stallion, foaled in the year 1874, *not qualified to compete as Clydesdale or Suffolk* ..	20	10	5
2	Agricultural Stallion, foaled before 1st Jan. 1874, *not qualified to compete as Clydesdale or Suffolk*	20	10	5
3	Agricultural Stallions	60*	40*	..
	SPECIAL CONDITION, *applying to Class 3.* The winner of the First Prize to travel in North Warwickshire Parliamentary division, to stand one day each week in season 1877 at Birmingham, and one day at Warwick. The winner of the Second Prize to travel in South Warwickshire Parliamentary division, and to stand one day each week in season 1877 at Warwick.			
4	Clydesdale Stallion, foaled in the year 1874 ..	20	10	5
5	Clydesdale Stallion, foaled before the 1st Jan. 1874	20	10	5
6	Suffolk Stallion, foaled in the year 1874	20	10	5
7	Suffolk Stallion, foaled before the 1st of Jan. 1874	20	10	5
8	Thorough-bred Stallion, suitable for getting Hunters	50	20	10
9	Stallion, suitable for getting Hackneys, not exceeding 15 hands 2 inches	20	10	5
10	Pony Stallion, not exceeding 14 hands	20	10	5
	BROOD MARES AND AGRICULTURAL FILLIES.			
11	Agricultural Mare and foal, *not qualified to compete as Clydesdale or Suffolk*	20	10	5
12	Clydesdale Mare and foal	20	10	5
13	Suffolk Mare and foal	20	10	5
14	Agricultural Geldings or Fillies, four years old, *not qualified to compete as Clydesdale or Suffolk* ..	20*	10*	5*
15	Agricultural Geldings or Fillies, three years old, *not qualified to compete as Clydesdale or Suffolk*	20*	10*	5*

Reference Number in Certificates.	HORSES—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
16	Clydesdale Filly, three years old	15	10	..
17	Suffolk Filly, three years old	15	10	..
18	Agricultural Geldings, or Fillies, two years old, *not qualified to compete as Clydesdale or Suffolk*	20*	10*	5*
19	Clydesdale Filly, two years old	15	10	..
20	Suffolk Filly, two years old	15	10	..
21	Agricultural Geldings or Fillies, one year old, *not qualified to compete as Clydesdale or Suffolk* ..	15*	10*	5*
22	Mare and Foal, suitable for breeding Hunters ..	20	10	5
23	Mare and Foal, suitable for breeding Hackneys ..	20	10	5
24	Pony Mare and Foal, not exceeding 14 hands ..	15	10	5
	HUNTERS.			
25	Hunter Filly, two years old	15	10	..
26	Hunter Mare, three years old	15	10	..
27	Geldings, for hunting purposes, two years old ..	15*	10*	..
28	Geldings, for hunting purposes, three years old ..	15*	10*	..
29	Hunter Mare, four years old	25	15	10
30	Hunter Gelding, four years old	25	15	10
31	Hunter Mare or Gelding, five years old and upwards, up to not less than 12 stone	30	20	10
32	Hunter Mare or Gelding, five years old and upwards, up to not less than 14 stone	30	20	10
33	Hunters, not exceeding 15 hands 2 inches, four years old and upwards	20*	10*	..
	Plate for the best Hunter in any of the classes 29 to 33	25*	..	..
	HACKNEYS AND ROADSTERS.			
34	Hackney Mare or Gelding, exceeding 15 hands, and up to not less than 12 stone	15	10	5
35	Hackney Mare or Gelding, exceeding 15 hands, and up to not less than 14 stone	15	10	5
36	Weight-carrying Hacks or Roadsters, above 14 and not exceeding 15 hands	15*	10*	5*
37	Park or Ladies' Hacks, above 14 and not exceeding 15 hands	15*	10*	5*
	PONIES.			
38	Pony Mare or Gelding, above 13 hands, and not exceeding 14 hands	15	10	5
39	Pony Mare or Gelding, not exceeding 13 hands ..	15.	10	5

HORSES—continued.

Harness Horses and Ponies.

(To be shown in harness with suitable vehicles.)

Reference Number in Certificates. Class		First Prize. £.	Second Prize. £.	Third Prize. £.	Fourth Prize. £.
40	Harness Mares or Geldings over 15 hands	20*	10*	5*	
41	Harness Mares or Geldings over 14 and not exceeding 15 hands	20*	10*	5*	
42	Harness Pony over 13 and not exceeding 14 hands	15*	10*	5*	
43	Harness Pony, not exceeding 13 hands	15*	10*	5*	

No Third Prize will be given unless at least Six animals be exhibited, and no Second Prize will be given unless at least Three animals be exhibited, except on the special recommendation of the Judges to the Stewards of Live Stock

CATTLE.

(All Ages calculated to July 1st, 1876.)

Shorthorn.

Reference Number in Certificates. Class		First Prize. £.	Second Prize. £.	Third Prize. £.	Fourth Prize. £.
44	Bull, above three years old	30	20	15	10
45	Bull, above two and not exceeding three years old	25	15	10	5
46	Yearling Bull, above one and not exceeding two years old	25	15	10	5
47	Bull-Calf, above six and not exceeding twelve months old	15	10	5	..
48	Cow, above three years old	20	10	5	
49	Heifer, in-milk or in-calf, not exceeding three years old	20	15	10	5
50	Yearling Heifer, above one and not exceeding two years old	20	15	10	5
51	Heifer-Calf, above six and under twelve months old	15	10	5	..

Hereford.

Reference Number in Certificates. Class		First Prize. £.	Second Prize. £.	Third Prize. £.	Fourth Prize. £.
52	Bull, above three years old	25	15	5	
53	Bull, above two and not exceeding three years old	25	15	5	
54	Yearling Bull, above one and not exceeding two years old	25	15	5	
55	Bull-Calf, above six and not exceeding twelve months old	10	5	..	
56	Cow, above three years old	20	10	5	
57	Heifer, in-milk or in-calf, not exceeding three years old	15	10	5	
58	Yearling Heifer, above one and not exceeding two years old	15	10	5	
59	Heifer-Calf, above six and under twelve months old	10	5	..	

Reference Number in Certificates.	CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	DEVON.			
60	Bull, above three years old	25	15	5
61	Bull, above two and not exceeding three years old	25	15	5
62	Yearling Bull, above one and not exceeding two years old	25	15	5
63	Bull-Calf, above six and not exceeding twelve months old	10	5	..
64	Cow, above three years old	20	10	5
65	Heifer, in-milk or in-calf not exceeding three years old	15	10	5
66	Yearling Heifer, above one and not exceeding two years old	15	10	5
67	Heifer-Calf, above six and under twelve months old	10	5	..
	No Fourth Prize will be given in either of the Shorthorn Classes, Nos. 44, 45, 46, 49 *and* 50, *unless at least Ten animals be exhibited.*			
	JERSEY.			
68	Bull, above two years old	15	10	5
69	Bull, above one year old and not exceeding two	15	10	5
70	Cow, above three years old	15	10	5
71	Heifer, in-milk or in-calf, not exceeding three years old	15	10	5
	GUERNSEY.			
72	Bull, above one year old	10	5	..
73	Cow, above three years old	10	5	..
74	Heifer, in-milk or in-calf, not exceeding three years old	10	5	..
	SUSSEX.			
75	Bull, above three years old	15	10	..
76	Bull, above two years old and not exceeding three	15	10	..
77	Yearling Bull, above one year old and not exceeding two	10	5	..
78	Cow, above three years old	15	10	..
79	Heifer, in-milk or in-calf, above two years old and not exceeding three	15	10	..
80	Yearling Heifer above one year old and not exceeding two	10	5	..
	LONG-HORNS.			
81	Bulls over two years old	20*	10*	5*
82	Bull, over one year old and not exceeding two	10*	5*	..
83	Cows over three years old	20*	10*	5*

Reference Number in Certificates	CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
84	Heifers over two and not exceeding three years old, in-milk or in-calf	20*	10*	5
85	Heifers not exceeding two years old	20*	10*	5
	DAIRY CATTLE.			
86	Pairs of Cows, in-milk, over three years old ..	25*	15*	10
87	Single Cows, in-milk, over three years old	15*	10*	5*
	No Third Prize will be given unless at least Six animals be exhibited, and no Second Prize will be given unless at least Three animals be exhibited, except on the special recommendation of the Judges to the Stewards of Stock.			
	SHEEP.			
	LEICESTER.			
88	Shearling Ram	20	10	5
89	Ram of any other age	20	10	5
90	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
	COTSWOLD.			
91	Shearling Ram	20	10	5
92	Ram of any other age	20	10	5
93	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
	LINCOLNS.			
94	Shearling Ram	20	10	5
95	Ram of any other age	20	10	5
96	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
	OXFORDSHIRE DOWN.			
97	Shearling Ram	20	10	5
98	Ram of any other age	20	10	5
99	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
	SOUTHDOWN.			
100	Shearling Ram	20	10	5
101	Ram of any other age	20	10	5
102	Pen of Five Shearling Ewes, of the same flock ..	15	10	5

Reference Number in Certificates.	SHEEP—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	SHROPSHIRE.			
103	Shearling Ram	20	10	5
104	Ram of any other age	20	10	5
105	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
106	Pen of Ten Ewes, having bred and suckled Lambs	20*	10*	5*
107	Pen of Ten Ewe Lambs..	20*	10*	5*
108	Pen of Five Ram Lambs	20*	10*	5*
109	Pen of Five Yearling Wethers	20*	10*	5*
	And 25*l.* in Plate to the Exhibitor who secures the greatest number of points in all the Shropshire Sheep Classes. The First Prize to count 3 points, Second 2, and Third 1.			
	HAMPSHIRE AND OTHER SHORT-WOOLLED BREEDS.			
	Not qualified to compete as Southdown or Shropshire.			
110	Shearling Ram	20	10	5
111	Ram of any other age	20	10	5
112	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
	No Third Prize will be given unless at least Six animals be exhibited, and no Second Prize will be given unless at least Three animals be exhibited, except on the special recommendation of the Judges to the Stewards of Stock.			
	PIGS.			
	LARGE WHITE BREED.			
113	Boar, above six months and not exceeding twelve months old	10	5	..
114	Boar, above twelve months old	10	5	..
115	Pen of Three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old..	10	5	..
116	Breeding Sow	10	5	..
	SMALL WHITE BREED.			
117	Boar, above six months and not exceeding twelve months old	10	5	..
118	Boar, above twelve months old	10	5	..

Reference Number in Certificates.	PIGS—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
119	Pen of Three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old ..	10	5	..
120	Breeding Sow	10	5	..
	SMALL BLACK BREED.			
121	Boar, above six months and not exceeding twelve months old	10	5	..
122	Boar, above twelve months old	10	5	..
123	Pen of Three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old	10	5	..
124	Breeding Sow	10	5	..
	BERKSHIRE BREED.			
125	Boar, above six months and not exceeding twelve months old	10	5	..
126	Boar, above twelve months old	10	5	..
127	Pen of Three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old ..	10	5	..
128	Breeding Sow	10	5	..
	OTHER BREEDS.			
	Not eligible to compete in any of the preceding Classes.			
129	Boar, above six months and not exceeding twelve months old	10	5	..
130	Boar, above twelve months old	10	5	..
131	Pen of three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old ..	10	5	..
132	Breeding Sow	10	5	..
	No Third Prize will be given unless at least Six animals be exhibited, and no Second Prize will be given unless at least Three animals be exhibited, except on the special recommendation of the Judges to the Stewards of Stock.			

Reference Number in Certificates.		First Prize.	Second Prize.	Third Prize.
	WOOL.	£.	£.	£.
Class				
133	Six teg Long-wool Fleeces	10*	5*	..
134	Six teg Short-wool Fleeces	10*	5*	..
	BUTTER.			
135	Six Pounds made up in pounds	10*	5*	5
	CHEESE.			
136	1 cwt. over 6 inches thick	15*	10*	5*
137	1 cwt. not exceeding 6 inches thick	15*	10*	5*
	Prizes of 3*l.*, 2*l.*, and 1*l.* will be given to the Dairymaid in each class of Cheese.			

II.—IMPLEMENT AND MACHINERY PRIZES OFFERED BY THE SOCIETY.

Class		£.
1.	For the best Reaping Machine, with self-delivery in sheaf, clear of the horse-track	30
	For the second best	20
	For the third best	10
2.	For the best Reaping Machine, with self-delivery in swathe, clear of the horse-track	20
	For the second best	10
3.	For the best combined Reaping and Mowing Machine, without self-delivery	15
	For the second best	10
	For the third best	5
4.	For the best One-horse Reaping Machine	15
	For the second best	10
	For the third best	5

The power of Machines entered in Class 4 must not exceed 33,000 foot-pounds per minute, at or about 2½ miles per hour.

A Machine may be entered in two Classes if it can perform both operations without adding or taking away parts. A distinct implement must, however, be entered for each Class.

The Gold Medal of the Society will be awarded at Birmingham, or any future Meeting of the Society, for an efficient Sheaf-binding Machine, either attached to a reaper or otherwise.

CONDITIONS APPLYING TO CERTAIN CLASSES OF LIVE STOCK ONLY.

HORSES.

1. All foals must be the offspring of the mare along with which they are exhibited; and the sire of the foal must be given on the certificate of entry.

2. No veterinary inspection of horses will be required except when considered necessary by the Judges, who will be accompanied by the Veterinary Inspectors.

3. Hunters and Hackneys entered to compete in the light-weight classes will be disqualified if, in the opinion of the Judges, they are eligible to compete in the heavy-weight classes.

4. A charge of 1*l.* for the accommodation of a horse-box, in addition to the entry-fee, will be made for each entry for stallions and mares with foals at foot.

5. A charge of 10*s.* will be made, in addition to the entry-fee, for the accommodation of a stall for each animal in the other Horse Classes.

6. A charge of 10*s.* will be made, in addition to other fees, for the shedding accommodation for each vehicle brought with entries in the Classes 40, 41, 42, and 43.

7. Any exhibitor wishing to remove his horse for the night will be allowed to do so on depositing 10*l.* at the Secretary's office, and receiving an official pass—the time of leaving, and that of returning next morning, to be inserted thereon; and if the animal be not duly brought back, the sum of 10*l.* will be forfeited to the Society for each Show day the animal is absent; and the exhibitor will also forfeit any prize awarded to him in any class at the Birmingham Show, and will not be allowed to exhibit again at the Society's Show until the forfeits are paid.

CATTLE.

8. No bull above two years old will be eligible for a prize unless certified to have served not less than three different cows (or heifers) within the three months preceding the 1st of June in the year of the Show.

9. All bulls above one year old shall have rings or "bull-dogs" in their noses, and be provided with leading sticks.

10. No cow will be eligible for a prize unless certified either at the date of entry or between the date of entry and that of the Show, to have had a living calf, or that the calf, if dead, was born at its proper time, within the twelve months preceding the date of the Show. Every Cow of the Channel Island breeds entered as in-milk shall be milked dry on the evening preceding the Show, in the presence of an officer of the Society, specially appointed for the purpose.

11. No heifer, entered as in-calf, will be eligible for a prize unless she is certified to have been bulled before the 31st of March in the year of the Show, nor will her owner afterwards receive the prize until he shall have furnished the Secretary with a further certificate before the 31st of January in the subsequent year, that she produced a living calf; or that the calf, if dead, was born at its proper time.

12. Shorthorns.—Each animal entered in the Shorthorn Classes must be certified by the Exhibitor to have not less than four crosses of Shorthorn blood which are, or are eligible to be, registered in the herd-book.

SHEEP.

13. All rams, except shearlings, must have been used in the preceding year.

14. Sheep exhibited for any of the prizes must have been *really and fairly shorn bare* after the 1st of April in the year of the Exhibition; and the date of such shearing must form part of the Certificate of Entry. Inspectors will be appointed by the Council to examine the sheep on their admission to the Show-Yard, with instructions to report to the Stewards any cases in which the sheep have not been *really and fairly shorn bare.*

PIGS.

15. The three sow-pigs in each pen must be of the same litter.

16. The breeding sows in Classes 116, 120, 124, 128, and 132, shall be certified to have had a litter of live pigs within the six months preceding the Show, or to be in-pig at the time of entry, so as to produce a litter before the 1st of September following. In the case of in-pig sows, the prize will be withheld until the exhibitor shall have furnished the Secretary with a certificate of farrowing, as above.

17. No sow, if above eighteen months old, that has not produced a litter of live pigs, shall be eligible to compete in any of the classes.

18. The Judges of pigs will be instructed, with the sanction of the Stewards, to withhold prizes from any animals which shall appear to them to have been entered in a wrong class.

19. All pigs exhibited at the Country Meetings of the Society shall be subjected to an examination of their mouths by the Veterinary Inspector of the Society; and should the state of dentition in any pig indicate that the age of the animal has not been correctly returned in the Certificate of Entry, the Stewards shall have power to disqualify such pig, and shall report the circumstance to the Council at its ensuing Monthly Meeting. Every pig which shall be found on examination by the Inspector to be oiled or coloured will be disqualified for competition and removed from the Show-Yard; as well as any pig which shall be oiled or coloured while in the Show-Yard.

20. If a litter of pigs be sent with a breeding sow, the young pigs must be the produce of the sow, and must not exceed two months old.

RULES OF ADJUDICATION.

1. As the object of the Society in giving prizes for cattle, sheep, and pigs, is to promote improvement in *breeding* stock, the Judges, in making their awards, will be instructed not to take into their consideration the present value to the butcher of animals exhibited, but to decide according to their relative merits for the purpose of *breeding.*

2. If, in the opinion of the Judges, there should be equality of merit, they will be instructed to make a special report to the Council, who will decide on the award.

3. The Judges will be instructed to withhold any prize if they are of opinion that there is not sufficient merit in any of the stock exhibited for such prize to justify an award.

4. The Judges will be instructed to give in a *Reserved Number* in each class of live stock; viz., which animal would, in their opinion, possess sufficient merit for the prize, in case the animal to which the prize is awarded should subsequently become disqualified.

5. In the classes for stallions, mares, and fillies, the Judges in awarding the prizes will be instructed, in addition to symmetry, to take activity and strength into their consideration.

6. The attention of the Stewards and Judges is particularly called to the conditions applying to pigs. The Senior Steward of Live Stock is requested to report any malpractices on the part of Exhibitors, and any person found guilty will not be allowed to exhibit at future Meetings of the Society.

The Judges will be instructed to deliver to the Stewards their awards signed, and stating the numbers to which the prizes are adjudged, before they leave the Yard, noting any disqualifications. They are to transmit, under cover to the Secretary, immediately after the Show, their Reports on the several classes in which they have adjudicated, in order that each Report may be included in the General Report of the Exhibition of Live Stock at Birmingham, to be published in the 'Journal' of the Society.

CONDITIONS RELATING TO IMPLEMENTS.

CONDITIONS OF TRIALS.

1. Such implements as the Judges may direct will be tested for draught, side-pull, &c., by means of the horse-dynamometer, which was used in the mowing-machine trials at Taunton, and which is fully described in the Society's 'Journal' for 1874, Second Series, vol. x., pages 679–682.
2. The draught in each particular case will be taken on the dynamometer through the ordinary draught chains, and every precaution will be taken to make the angle and direction of draught, side-pull, &c., as similar as possible to those which ordinary farm-horses have to work against.
3. The Trials of reaping-machines will be directed to test the qualities of the implements under conditions as various as the season and the state of the crops in the Trial-fields will permit.
4. The implements will be carefully weighed, so as to determine the distribution of weight, in the presence of the exhibitors, either when the machines are handed over to the custody of the Engineers, or when they are delivered back again to the exhibitors before the Trials.
5. The implements selected at the Show for future Trial, will be taken charge of by the Engineers, as provided by paragraph 20, page 9 of the General Regulations, and no access will be allowed to them for any purpose whatever until the Trials commence. The exhibitors are recommended to deliver up the machines in complete order, and protected in the usual way from rust.
6. Platforms will be provided for setting the height of cut accurately.

DATES OF ENTRY FOR LIVE STOCK AND IMPLEMENTS.

CERTIFICATES for the entry of Implements for the Birmingham Meeting must be forwarded to the Secretary of the Society, No. 12, Hanover Square, London, W., by the 1st of May, and Certificates for the entry of Live Stock by the 1st of June. Certificates received after those respective dates will not be accepted, but returned to the persons by whom they have been sent.

The Prizes of the Royal Agricultural Society of England, and all Prizes offered by the Birmingham Local Committee, are open to general competition.

⁂ Forms of Certificate for entry, as well as Prize-Sheets for the Birmingham Meeting, containing the whole of the conditions and regulations, may be obtained at the Office of the Society, No. 12, Hanover Square, London. W.

Members' Veterinary Privileges.

I.—SERIOUS OR EXTENSIVE DISEASES.

No. 1. Any Member of the Society who may desire professional attendance and special advice in cases of serious or extensive disease among his cattle, sheep, or pigs, and will address a letter to the Secretary, will, by return of post, receive a reply stating whether it be considered necessary that the Society's Veterinary Inspector should visit the place where the disease prevails.

No. 2. The remuneration of the Inspector will be 2*l.* 2*s.* each day as a professional fee, and 1*l.* 1*s.* each day for personal expenses; and he will also be allowed to charge the cost of travelling to and from the locality where his services may have been required. The fees will be paid by the Society, but the travelling expenses will be a charge against the applicant. This charge may, however, be reduced or remitted altogether at the discretion of the Council, on such step being recommended to them by the Veterinary Committee.

No. 3. The Inspector, on his return from visiting the diseased stock, will report to the Committee, in writing, the results of his observations and proceedings, which Report will be laid before the Council.

No. 4. When contingencies arise to prevent a personal discharge of the duties confided to the Inspector, he may, subject to the approval of the Committee, name some competent professional person to act in his stead, who shall receive the same rates of remuneration.

II.—ORDINARY OR OTHER CASES OF DISEASE.

Members may obtain the attendance of the Veterinary Inspector on any case of disease by paying the cost of his visit, which will be at the following rate, viz., 2*l.* 2*s.* per diem, and travelling expenses. Applications should be addressed to the Superintendent of the Brown Institution, care of the Secretary of the Royal Agricultural Society, 12, Hanover Square, London, W.

III.—CONSULTATIONS WITHOUT VISIT.

Personal consultation with Veterinary Inspector	5*s.*
Consultation by letter	5*s.*
Consultation necessitating the writing of three or more letters	10*s.*
Post-mortem examination, and report thereon	10*s.*

A return of the number of applications from Members of the Society during each half-year is required from the Veterinary Inspector.

IV.—ADMISSION OF DISEASED ANIMALS TO THE BROWN INSTITUTION, WANDSWORTH ROAD, LONDON, S.W.; INVESTIGATIONS, LECTURES, AND REPORTS.

No. 1. All Members of the Society have the privilege of sending cattle, sheep, and pigs to the Infirmary of the Brown Institution, on the following terms; viz., by paying for the keep and treatment of cattle 10*s.* 6*d.* per week each animal, and for sheep and pigs "a small proportionate charge to be fixed by the Professor-Superintendent according to circumstances."

No. 2. The Professor-Superintendent of the Institution has also undertaken to carry out such investigations relating to the nature, treatment, and prevention of diseases of cattle, sheep, and pigs, as may be deemed expedient by the Council.

No. 3. A detailed Report of the cases of cattle, sheep, and pigs treated in the Infirmary of the Institution, or on Farms in the occupation of Members of the Society, will be furnished to the Council quarterly; and also special reports from time to time on any matter of unusual interest which may come under the notice of the Institution.

By Order of the Council,
H. M. JENKINS, *Secretary.*

Members' Privileges of Chemical Analysis.

The Council have fixed the following rates of Charge for Analyses to be made by the Consulting Chemist for the *bonâ fide* use of Members of the Society; who (to avoid all unnecessary correspondence) are particularly requested, when applying to him, to mention the kind of analysis they require, and to quote its number in the subjoined schedule. The charge for analysis, together with the carriage of the specimens, must be paid to him by members at the time of their application.

No. 1.	—An opinion of the genuineness of Peruvian guano, bone-dust, or oil-cake (each sample)	5*s.*
„ 2.	—An analysis of guano; showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts, and ammonia	10*s.*
„ 3.	—An estimate of the value (relatively to the average of samples in the market) of sulphate and muriate of ammonia, and of the nitrates of potash and soda	10*s.*
„ 4.	—An analysis of superphosphate of lime for soluble phosphates only	10*s.*
„ 5.	—An analysis of superphosphate of lime, showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime, and ammonia ..	£1.
„ 6.	—An analysis (sufficient for the determination of its agricultural value) of any ordinary artificial manure	£1.
„ 7.	—Limestone:—the proportion of lime, 7*s.* 6*d.*; the proportion of magnesia, 10*s.*; the proportion of lime and magnesia	15*s.*
„ 8.	—Limestone or marls, including carbonate, phosphate, and sulphate of lime, and magnesia with sand and clay ..	£1.
„ 9.	—Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime	£1.
„ 10.	—Complete analysis of a soil	£3.
„ 11.	—An analysis of oil-cake, or other substance used for feeding purposes; showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre; as well as of starch, gum, and sugar, in the aggregate	£1.
„ 12.	—Analyses of any vegetable product	£1.
„ 13.	—Analyses of animal products, refuse substances used for manure, &c.	from 10*s.* to 30*s.*
„ 14.	—Determination of the "hardness" of a sample of water before and after boiling	10*s.*
„ 15.	—Analysis of water of land drainage, and of water used for irrigation	£2.
„ 16.	—Determination of nitric acid in a sample of water	£1.

N.B.—*The above Scale of Charges is not applicable to the case of persons commercially engaged in the Manufacture or Sale of any Substance sent for Analysis.*

The Address of the Consulting Chemist of the Society is, Dr. Augustus Voelcker, F.R.S., 11, Salisbury Square, London, E.C., to which he requests that all letters and parcels (Postage and Carriage paid) should be directed.

By Order of the Council,
H. M. JENKINS, *Secretary.*

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

ARTIFICIAL MANURES.—Take a large handful of the manure from three or four bags, mix the whole on a large sheet of paper, breaking down with the hand any lumps present, and fold up in tinfoil, or in oil silk, about 3 oz. of the well-mixed sample, and send it to 11, SALISBURY SQUARE, FLEET STREET, E.C., by post: or place the mixed manure in a small wooden or tin box, which may be tied by string, but must not be sealed, and send it by post. If the manure be very wet and lumpy, a larger boxful, weighing from 10 to 12 oz., should be sent either by post or railway.

Samples not exceeding 4 oz. in weight may be sent by post, by attaching two penny postage stamps to the parcel.

Samples not exceeding 8 oz., for three postage stamps.

Samples not exceeding 12 oz., for four postage stamps.

The parcels should be addressed: DR. AUGUSTUS VOELCKER, 11, SALISBURY SQUARE, FLEET STREET, LONDON, E.C., and the address of the sender or the number or mark of the article be stated on parcels.

The samples may be sent in covers, or in boxes, bags of linen or other materials. No parcel sent by post must exceed 12 oz. in weight, 1 foot 6 inches in length, 9 inches in width, and 6 inches in depth.

SOILS.—Have a wooden box made 6 inches long and wide, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil with its subsoil from 9 to 12 inches deep; trim this block or plan of the field to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up, gently turn over the box, nail on the lid and send it by goods or parcel to the laboratory. The soil will then be received in the exact position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

WATERS.—Two gallons of water are required for analysis. The water, if possible, should be sent in glass-stoppered Winchester half-gallon bottles, which are readily obtained in any chemist and druggist's shop. If Winchester bottles cannot be procured, the water may be sent in perfectly clean new stoneware spirit-jars surrounded by wickerwork. For the determination of the degree of hardness before and after boiling, only one quart wine-bottle full of water is required.

LIMESTONES, MARLS, IRONSTONES, AND OTHER MINERALS.—Whole pieces, weighing from 3 to 4 oz., should be sent enclosed in small linen bags, or wrapped in paper. Postage 2*d.*, if under 4 oz.

OILCAKES.—Take a sample from the middle of the cake. To this end break a whole cake into two. Then break off a piece from the end where the two halves were joined together, and wrap it in paper, leaving the ends open, and send parcel by post. The piece should weigh from 10 to 12 oz. Postage, 4*d.* If sent by railway, one quarter or half a cake should be forwarded.

FEEDING MEALS.—About 3 oz. will be sufficient for analysis. Enclose the meal in a small linen bag. Send it by post.

On forwarding samples, separate letters should be sent to the laboratory, specifying the nature of the information required, and, if possible, the object in view.

H. M. JENKINS, *Secretary.*

Members' Botanical Privileges.

The Council have provisionally fixed the following Rates of Charge for the examination of Plants and Seeds for the *bonâ fide* use of Members of the Society, who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined Schedule. The charge for examination must be paid to the Consulting Botanist at the time of application, and the carriage of all parcels must be prepaid.

No. 1.	—A general opinion as to the genuineness and age of a sample of clover-seed (each sample)	5*s.*
„ 2.	—A detailed examination of a sample of dirty or impure clover-seed, with a report on its admixture with seeds of dodder or other weeds (each sample)	10*s.*
„ 3.	—A test examination of turnip or other cruciferous seed, with a report on its germinating power, or its adulteration with 000 seed (each sample)	10*s.*
„ 4.	—A test examination of any other kind of seed, or corn, with a report on its germinating power (each sample) ..	10*s.*
„ 5.	—Determination of the species of any indigenous British plant (not parasitic), with a report on its habits (each species)	5*s.*
„ 6.	—Determination of the species of any epiphyte or vegetable parasite, on any farm-crop grown by the Member, with a report on its habits, and suggestions (where possible) as to its extermination or prevention (each species) ..	10*s.*
„ 7.	—Report on any other form of plant-disease not caused by insects	10*s.*
„ 8.	—Determination of the species of a collection of natural grasses indigenous to any district on one kind of soil (each collection)	10*s.*

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES.

In sending seed or corn for examination the utmost care must be taken to secure a fair and honest sample. If anything supposed to be injurious or useless exists in the corn or seed, selected samples should also be sent.

In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. Place them in a bottle, or pack them in tin-foil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

N.B.—*The above Scale of Charges is not applicable in the case of Seedsmen requiring the services of the Consulting Botanist.*

Parcels or letters (Carriage or Postage prepaid) to be addressed to Mr. W. Carruthers, F.R.S., 4, Woodside Villas, Gipsy Hill, S.E.

H. M. JENKINS, *Secretary.*

Royal Charter,

INCORPORATING THE

ENGLISH AGRICULTURAL SOCIETY

AS THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

MARCH 26, 1840.

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, to all to whom these presents shall come, greeting.

1. Whereas our right trusty and right entirely beloved cousin and counsellor, Charles Duke of Richmond, Knight of the most noble Order of the Garter, our right trusty and right entirely beloved cousin, George Henry Duke of Grafton, Knight of the most noble Order of the Garter, our right trusty and right entirely beloved cousin, John Henry Duke of Rutland, Knight of the most noble Order of the Garter, our right trusty and right entirely beloved cousin, George Granville Duke of Sutherland, our right trusty and entirely beloved cousin, Arthur Blundell Sandys Trumbal Marquess of Downshire, Knight of the most illustrious Order of Saint Patrick, our right trusty and right well beloved cousin and counsellor John Charles Earl Spencer, our trusty and well beloved Robert Henry Clive, Esquire, Sir Francis Lawley, Baronet, and Sir Thomas Dyke Acland, Baronet, our right trusty and well beloved counsellor Sir James Robert George. Graham, Baronet, and our trusty and well beloved Henry

Handley and Joseph Neeld, Esquires, and others of our loving subjects, have formed themselves into a Society for the general advancement of English Agriculture, and for the purpose of prosecuting the following national Objects, namely:—First, to embody such information contained in agricultural publications, and in other scientific works as has been proved by practical experience to be useful to the cultivators of the soil; second, to correspond with Agricultural, Horticultural, and other Scientific Societies, both at home and abroad, and to select from such correspondence all information which, according to the opinion of the Society, may be likely to lead to practical benefit in the cultivation of the soil; third, to pay to any occupier of land, or other person who shall undertake, at the request of the Society, to ascertain by any experiment how far such information leads to useful results in practice, a remuneration for any loss that he may incur by so doing; fourth, to encourage men of science in their attention to the improvement of agricultural implements, the construction of farm-buildings and cottages, the application of chemistry to the general purposes of agriculture, the destruction of insects injurious to vegetable life, and the eradication of weeds; fifth, to promote the discovery of new varieties of grain and other vegetables useful to man or for the food of domestic animals; sixth, to collect information with regard to the management of woods, plantations, and fences, and on every other subject connected with rural improvement; seventh, to take measures for the improvement of the education of those who depend upon the cultivation of the soil for their support; eighth, to take measures for improving the veterinary art, as applied to cattle, sheep, and pigs; ninth, at the Meetings of the Society in the country, by the distribution of prizes, and by other means, to encourage the best mode of farm cultivation and the breed of live stock; tenth, to promote the comfort and welfare of labourers, and to encourage the improved management of their cottages and gardens: And have subscribed and expended divers large sums of money in the prosecution of these their national and patriotic objects, being regulated in their purpose by the strictest exclusion from their councils of every question of discussion having a political tendency, or which shall refer to any matter to be brought forward, or at any time pending in either of our Houses of Parliament: And having such objects, and being regulated by such essential principle, they have humbly besought us to grant unto them, and such other persons as shall be approved and elected in manner hereinafter mentioned, our Royal Charter of Incorporation for the several purposes aforesaid.

2. Now, therefore, know ye, that we, being anxious of promoting and encouraging by our Royal protection and patronage a series of objects which, prosecuted under the regulating principle of the exclusion of all those questions of debate on which the people of every individual country entertain sentiments so much at variance with each other, cannot fail to lead to results, affecting in the highest degree the prosperity of our people and the national wealth of our kingdom, have, of our especial grace and favour, given and granted, and do by these presents for us, our heirs, and successors, give and grant that the said Charles Duke of Richmond, George Henry Duke of Grafton, John Henry Duke of Rutland, George Granville Duke of Sutherland, Arthur Blundell Sandys Trumbal Marquess of Downshire, John Charles Earl Spencer, Robert Henry Clive, Sir Francis Lawley, Sir Thomas Dyke Acland, Sir James Robert George Graham, Henry Handley, and Joseph Neeld, and such others of our loving subjects as have formed themselves into, and are now, subscribers of the said Society, or who shall at any time hereafter become subscribers thereof, according to such regulations or bye-laws as shall be hereafter framed or enacted, shall by virtue of these presents be, and for ever hereafter continue to be, one body politic and corporate for the purposes afore-

Name. said, by the name of the "Royal Agricultural Society of England," by which name they shall have perpetual succession and a common seal, with full power and authority to alter, vary, break, and renew the same at their own discretion, and by the same name shall sue and be sued, implead and be impleaded, answer and be answered unto in every Court of us, our heirs, and successors, and be for ever able and capable in the law to purchase, receive, possess, and enjoy to them and their successors any goods and chattels whatsoever, and also be able and capable in the law (notwithstanding the statutes of Mortmain) to take, purchase, possess, hold, and enjoy to them and their successors a hall, and any messuages, lands, tenements, or hereditaments whatsoever, the yearly value of which, including the site of the said hall, shall not exceed in the whole the sum of Three Thousand Pounds, computing the same respectively at the rack-rent which might have been had or gotten for the same respectively at the time of the purchase or acquisition thereof; and to act in all the concerns of the said body politic and corporate, for the purposes aforesaid, as fully and effectually to all intents, effects, constructions, and purposes whatsoever, as any other of our liege subjects, or any other body politic or corporate, in our United Kingdom of Great Britain and Ireland, not being under any disability, might do in their respective concerns.

Seal.

To sue and be sued.

Power to hold Lands, &c.

3. And we do hereby grant our especial licence and authority unto all and every person and persons, bodies politic and corporate (otherwise competent), to grant, sell, alien, and convey in mortmain unto, and to the use of, the said Society and their successors, any messuages, lands, tenements, or hereditaments, not exceeding such annual value as aforesaid.

4. And know ye further, that in granting this our Royal Charter to the said Royal Agricultural Society of England, we do hereby declare it to be our full and entire will and pleasure that we extend our Royal protection to its national

Exclusion of Politics.

objects, under the condition that a principle of its constitution shall be the total exclusion of all questions at its meetings, or in its proceedings, of a political tendency, or having reference to measures pending, or to be brought forward, in either of our Houses of Parliament, which no resolution, bye-law, or other enactment of the said body politic and corporate, shall on any account or pretence whatever be at any time allowed to infringe.

Number.

Governors and Members.

5. We further declare, that the number of Subscribers of the said body politic and corporate shall be indefinite, but classed according to their election or rate of payment into governors and members, with such individual privileges as shall appertain respectively unto each, there being added to the Society such honorary, corresponding, and foreign members as may be found desirable for the promotion of its several objects.

General Meetings.

Country Meeting.

Date of General Meeting.

President and Council.

Vacancies.

6. It is also our will and pleasure, that there be three general meetings of such governors and members of the said Society held in each year, namely, two of these general meetings in London, in the months of May and December, and the other in such other part of England or Wales as shall be deemed most advantageous in time and place for the advancement of the objects of the Society. We further will and declare, that at such general meeting in London, to be held on the twenty-second or (should that date fall on a Sunday) on the twenty-third day of May, the governors and members shall have full power to elect a president and council, which president and council, although then duly elected, shall, nevertheless, not come into office until after the day of the annual country meeting next following, and shall then continue from that day in their respective offices and appointments for one year (more or less according to the date of the next annual country meeting); all vacancies occurring in such offices and appointments by resignation, death, or otherwise, to be filled up by election, and the

Council to consist of.

President.

Retirement by rotation.

majority of votes of the remaining members of such president and council. That the council shall consist of one president, twelve trustees, and twelve vice-presidents, to be elected from the class of governors only, and of fifty other members, to be elected indiscriminately from the governors and members of the Society: That the president shall be an annual officer of the Society, and not re-eligible to the office of president for three years. And further, that twenty-five of the fifty general members of the council shall go out by rotation each year, but may be re-elected.

Election of Officers and Council.

Bye-laws.

Notice of Alteration.

Secretary.

7. We further will, declare, and grant, that such general meeting in May shall have the full power and privilege of electing the president, trustees, vice-presidents, and other members of the council, from the governors and members as aforesaid; and that such president, trustees, vice-presidents, and council, shall be regulated in their proceedings by such bye-laws as may and shall from time to time be enacted by them conformably with the tenor of these letters patent, no established bye-law, however, being in any case altered, or new one proposed, without at least one month's notice of such intention being given to each member of the council. Further, that such president and council so elected shall have the power both to appoint, and, as they may think fit, to remove, one general secretary to the Society, who will be responsible to them for the execution and discharge of the various duties required of him, as defined from time to time by their bye-laws or special resolutions. And we further will and declare, that the said body politic and corporate may by him as their secretary sue or be sued, contract or discharge, in their name and on their behalf.

First President.

Council.

8. We further will and declare it as our Royal pleasure that the said Charles Duke of Richmond shall be the first president of the said Royal Agricultural Society of England, and that he, with the said George Henry Duke of Grafton, John Henry Duke of Rutland, George Granville Duke of

Sutherland, Arthur Blundell Sandys Trumbal Marquess of Downshire, John Charles Earl Spencer, Robert Henry Clive, Sir Francis Lawley, Sir Thomas Dyke Acland, Sir James Robert George Graham, Henry Handley, and Joseph Neeld, shall be members of the first council, any three or more of whom shall hereby be invested with full power, being first duly summoned to attend, to appoint, on or within ten days preceding or following the twenty-fifth day of the present month of March, such persons to be trustees, vice-presidents, council, governors, members, honorary members, corresponding members, and foreign members, as they shall respectively think fit.

Management.

9. And we further will, grant, and declare, that the president and council shall have the sole management of the income and funds of the said body politic and corporate, and also the entire management and superintendence of all the other affairs and concerns thereof, and shall, or may, but not inconsistently with, or contrary to, the provisions of this our Charter or any existing bye-law, or the laws or statutes of this our realm, do all such acts and deeds as shall appear to them necessary or essential to be done, for the purpose of carrying into effect the objects and views of the said Royal Agricultural Society of England.

10. In witness whereof we have caused these our Letters to be made patent. Witness ourself at our palace at Westminster this twenty-sixth day of March, in the third year of our reign.

By Writ of Privy Seal.

(Signed) EDMUNDS.

I.—LAWS CONTAINED IN THE CHARTER, WHICH CANNOT AT ANY TIME BE ALTERED OR DEPARTED FROM.

Name.

1. The Society is a corporate body, by the name of the Royal Agricultural Society of England, and has a Common Seal.

Exclusion of Politics.

2. It is a condition of the Royal Charter that a principle of the constitution of the Society shall be the total exclusion of all questions, at its meetings or in its proceedings, of a political tendency, or having reference to measures pending or to be brought forward in either House of Parliament; which no resolution, bye-law, or other enactment of the said body politic and corporate shall, on any account or pretence whatever, be at any time allowed to infringe.

Number.

3. The number of subscribers is indefinite; and classed into Governors and Members.

4. Power is given to elect Honorary, Corresponding, and Foreign Members.

General Meetings.

5. Three General Meetings are to be held in each year: two of these in London, in the months of May and December; and the other in such part of England or Wales as shall be deemed most advantageous for the advancement of the objects of the Society. The General Meeting in London is to be held on the 22nd (or, should that date fall on a Sunday, on the 23rd) of May.

Election of President and Council.

6. The Governors and Members have full power to elect a President and Council at the general May Meeting; which President and Council, although then duly elected, shall nevertheless not come into office till the conclusion of the ensuing Annual Country Meeting to be held that year.

Vacancies.

All vacancies occurring in such officers and appointments, by resignation, death, or otherwise, are to be filled up by election and the majority of votes of the remaining Members of such President and Council.

Council to consist of.

7. The Council is to consist of one President, twelve Trustees, and twelve Vice-Presidents, to be elected from the class of

Governors only; and of fifty other Members to be elected indiscriminately from the Governors and Members of the Society.

8. The President is to be an annual officer of the Society, and not re-eligible to the office of President for three years.

Retirement by rotation.

9. Twenty-five of the fifty general Members of the Council are to go out each year by rotation, but may be re-elected.

10. The General Meeting in May shall elect the President, Trustees, Vice-Presidents, and other Members of Council, from the Governors and Members.

Bye-laws.

11. The Council is to be regulated in their proceedings by such bye-laws as may and shall from time to time be enacted by them conformably with the tenor of the Charter: no established bye-law being in any case altered, or new one proposed, without at least one month's notice of such intention being given to each Member of the Council.

Appointment of Secretary.

12. The Council have power to appoint and remove one general Secretary to the Society; such Secretary to sue and be sued in their name and on their behalf.

Council Management.

13. The Council have the sole management of the income and the funds of the said body politic and corporate; and also the entire management and superintendence of all other affairs and concerns thereof; and can—but not inconsistently with or contrary to the provisions of the Charter, or any existing bye-law, or the laws of the land—do all such acts and deeds as shall appear to them necessary or essential to be done for the purpose of carrying into effect the objects and views of the said Royal Agricultural Society of England.

II.—BYE-LAWS.

1. All existing Bye-Laws, Rules, and Regulations shall be rescinded, and the following be adopted in their places.

GOVERNORS AND MEMBERS.

Proposal of Governors and Members.

2. Every candidate for admission into the Society must be proposed by a Governor or Member, who must sign a certificate recommending him,* and specifying the name, rank, usual place of residence, and post-town, of the candidate, either at a Council-meeting, or by letter to the Secretary. Every such proposal shall be read at the Council-meeting at which it is made; or, if by a letter to the Secretary, at the first meeting of the Council next after the receipt of such letter. The Secretary shall then forward to the Candidate a printed copy of the Form [No. I. in the Appendix], for his signature. At the next monthly Meeting of the Council, after the Form shall have been returned to the Secretary, duly signed by the Candidate himself, the election shall take place by a show of hands: the majority of the Members of Council present to elect or reject. The Secretary shall inform the Candidate of his election by a letter [No. II. in the Appendix], or in such other terms as the Council may from time to time direct.

Commencement of Membership.

3. No person elected a Governor or Member shall be entitled to exercise any privilege as such, nor shall his name be printed in any list of the Society, until he shall have paid his subscription. Governors shall pay an annual subscription of 5*l*., and Members of 1*l*.; all subscriptions shall become due and payable in advance on the 1st of January in each year. Subscriptions paid on election in November and December will be considered as the subscription of the following year. Governors may, at any

Subscription.

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* Blank certificates of the form required, may be had of the Secretary, at the House of the Society.

Composition.

Members not resident in the United Kingdom.

Arrears.

time, compound for their future subscription by a single payment of 50*l.*; and Members, by one of 10*l.*, including the subscription for the current year; and after payment of their annual subscriptions for twenty years or upwards, Governors may compound for future subscriptions, including the current year, by a single payment of 25*l.*; and Members by a single payment of 5*l.* Governors and Members not resident in the United Kingdom shall, on election, pay the full life composition of 50*l.* or 10*l.* The subscription of each year remaining unpaid on and after the 1st of June, is to be considered as in arrear. No Governor or Member whose subscription is in arrear shall enjoy any of the privileges of the Society; nor be allowed to enter into a composition for his future payments until such arrear, excluding that for the current year, be paid. No Governor or Member shall be allowed to transfer his name from one class of Members to the other, respectively, without the express leave of the Council.

Privileges of Governors and Members.

4. Members of the Council have alone the right of voting, but Governors, not being Members of the Council, may attend and speak (but not vote) at all Meetings of the Council. Governors and Members alike have the right to attend, speak, and vote at the General Meetings of the Society, as provided by the Charter. Each Governor is entitled gratuitously to two copies of each part of the Society's Journal belonging to the year for which his subscription has been paid, and each Member to one copy; but no Journal will be forwarded to any Governor or Member whose subscription is in arrear. Governors and Members have the privilege of inspecting all models presented to the Society, and of referring to the books in the library; also the right to receive Chemical, Botanical, and Veterinary aid on such terms as the Council may from time to time determine; to exhibit Stock and Implements at the Society's Country-meetings at such rates as the Council may deem expedient; and to free admission to such Country-meetings.

Honorary, Corresponding, and Foreign Members.

5. Honorary, Corresponding, and Foreign Members may be elected by the Council, and shall not be called upon for the payment of any subscription; they may attend and speak, but not vote, at the Meetings of the Society and of the Council. The President shall sign, and the Secretary shall countersign, their Diplomas, to be forwarded to them by the Secretary as soon as may be after election.

Register.

6. An alphabetical Register shall be kept of the names of the Governors and Members, showing their addresses, the dates of their election, the subscriptions received or due from them, with the dates respectively of payment and arrear. Every Governor or Member shall, from time to time, communicate to the Secretary his address, or that of his banker or agent; and all notices or publications forwarded to the last communicated address shall be considered as having been duly delivered to such Governor or Member.

Address of Governors and Members.

Withdrawal of Governors and Members.

7. Any Governor or Member may withdraw from the Society, by signifying his wish to do so, by letter under his own hand, addressed to the Secretary at the house of the Society: but subject to the previous payment of all arrears of his subscription, including his subscription for the year in which he withdraws, and of all other sums, if any, due from him to the Society; and to the return of all books or other property, if any, borrowed by him of the Society: or making full compensation for the same, if lost or not forthcoming.

Dismissal.

8. Governors and Members (including Honorary, Foreign, and Corresponding Members) may be dismissed from the Society in the following manner:—Any ten Governors or Members of the Society may send, in writing, to the Council, a request, signed by them, that any Governor or Member shall be dismissed from the Society. Such request shall be placed in a conspicuous part of the Council-room, and a copy thereof signed by the Secretary shall be transmitted by post to the Governor or Member proposed to be dismissed. At the first monthly Meeting of the Council, at which twelve Members at the least shall be present, and which shall take place not less than one month after such request shall have been placed in the Council-room, the Council shall take the matter into their consideration. If the Council shall unanimously agree to the dismissal of such Governor or Member, he shall thereupon and thenceforth cease to be a Governor or Member of the Society; but if they shall not unanimously agree to his dismissal, their decision shall be considered to have been made in his favour. His dismissal, however, shall not relieve him from the payment of any arrears of his subscription, or of any other debt due by him to the Society; nor entitle him, if a Life Governor or Life Member, to the return of any portion of the commutation he has paid.

9. The Society shall not and may not make any dividend, gift, division, or bonus in money unto or between any of its Governors or Members.

Inability to make Dividend.

10. No Governor or Member shall be absolved from the effect of the provisions of the Charter, or of the Bye-laws, on the plea of not being acquainted with them, or of not having received a copy of them.

Effect of Charter and Bye-laws.

11. No Governor or Member, not being a Member of the Council, shall have any right of interference or control in or over the government of the Society, or of the management of its affairs or property.

Affairs of the Society.

GENERAL MEETINGS.

12. Public notice of the General Meetings of the Society shall be given in such newspapers as the Council may decide. The advertisements calling the General Meetings of the Society shall give the heads of the Agenda of such Meetings; and the advertisements for the May Meeting shall specially announce that the President, Trustees, Vice-Presidents and twenty-five Members of Council will be elected by the Governors and Members of the Society present at such Meeting. The General Meeting in December shall be held at such date in that month, and the Meeting in the country at such time and place, as the Council may decide. The place of Meeting in the country shall, as far as possible, be settled by the Council on the first Wednesday in May, and declared at the ensuing General Meeting in the year preceding such Meeting. At every General Meeting in London, a report and financial statement from the Council shall be read, and any Governor or Member present may ask any questions on the matters contained in such report, and may make any suggestions or recommendations relating to the Government of the Society or the management of its affairs, and these shall be considered by the Council at their next Monthly Meeting. Governors and Members attending the General Meetings must give their names in writing on being admitted. Strangers may also be admitted on special orders from the President.

General Meetings.

Country Meeting.

Persons to be present.

13. At the General Meeting in May, the election of the President, Vice-Presidents, and Trustees shall take place, before the commencement of any other business, by a show of hands. The

Mode of electing President and Council.

election of the twenty-five Members of the Council, who are to replace the twenty-five Members who retire by rotation, shall afterwards take place in the following manner :—

a. A list of the Members of Council who retire by rotation but are desirous of re-election, showing the number of attendances at Council and Committee Meetings of each of such Members during the past two years, shall be prepared at the April Council, and published immediately in at least two agricultural papers. Any two Governors or Members may nominate in writing to the Secretary before the first day of May following a Member or Members of the Society desirous of being nominated for election on the Council; these nominations, with the names of the proposer and seconder, shall also be added to the previously published list, and the entire list shall be published in the same agricultural papers immediately after the May Council, and be also printed for the use of Members at the General Meeting in May.

b. A copy of this list shall be given to any Governor or Member who applies to the Secretary, either on the day of the General Meeting, or on any day of the week preceding (Sunday excepted), between the hours of ten and four.

c. Each Governor or Member who wishes to vote, shall personally give in to the President at the General Meeting one of these lists signed by himself, with such names struck out, as he thinks fit. Any list containing, not erased, the names of more than twenty-five Members will be rejected. Three scrutineers shall be appointed by the President, who shall retire into another room, and inspect the lists given in, and report forthwith to the Meeting, in writing, the names of the twenty-five Governors or Members having the majority of votes; after which, the lists shall be immediately destroyed by the scrutineers. In the event of an equality of votes, the selection of the required numbers out of those candidates having such equality shall be made by the Meeting on a show of hands.

THE PRESIDENT.

14. In all the official relations of the Society, the President shall take precedence of all other Governors and Members, and shall take the chair at every Council-meeting when present. He shall sign all such letters, votes of thanks, and other documents, as the Council may direct, in the name and on the behalf of the Council. The President. Precedence.

THE COUNCIL.

15. The Council, subject to adjournment at their discretion, or to any future regulation, shall hold a Meeting on the first Wednesday in every month, at twelve o'clock, for the election of Members and for the transaction of the business of the Society. The Council. Adjournment. Monthly.

16. A Special Council may be summoned by the President at such time and place, and with such notice, or forthwith, as he may think fit; or in his absence by one Trustee, together with one Vice-President, and three other Members of the Council, by order to the Secretary, signed by them, for issuing summonses, allowing not less than seven days to elapse between the date of summons and the day appointed for the meeting of such Council. All orders or resolutions passed at any such Special Meeting shall be subject to confirmation or abrogation at the next ordinary Monthly Meeting of the Council. Special Council. Power of Summoning.

17. The Monthly Meeting of the Council shall have the full power of originating, discussing, and deciding, by the majority of votes, on a show of hands, all questions brought before it on the business of the Society, the President or other Chairman having the privilege of a casting vote. Any Member then present may, however, take the sense of the Meeting whether any question shall be postponed for further discussion to the next Monthly Meeting; and should one-third of the Members present so agree, such question shall be postponed accordingly, and due notice of such motion and postponement shall be given to all Members of the Council by the Secretary. Monthly Council. Adjournment of important discussions.

18. In the absence of the President the Chair shall be taken by a Trustee or Vice-President; and should neither of such officers be present, then by such Member as the Council shall choose as their Chairman by the majority of votes. Chairman.

19. The Quorum of a Monthly or Special Council shall be five. Quorum.

Minutes of the Proceedings.

20. Minutes of the proceedings of every Meeting of the Council shall be taken during their progress by the Secretary, or, in case of his absence, as the Chairman shall direct, and be afterwards copied fairly into a Minute-book, to be kept for that purpose, and, after being read at the next Monthly Meeting, shall be signed by the Chairman at that Meeting.

Orders of the Council.

Alteration of Orders of Council.

21. The Council may from time (without prejudice to the power conferred on them by the Charter to alter established Bye-Laws or make new ones) make such regulations, and issue such orders, not inconsistent with the Charter and Bye-Laws, as shall appear to them conducive to the good government of the Society, and to the proper management of its concerns: and all such regulations and orders shall be binding on all and every the Governors and Members, Honorary, Foreign, and Corresponding Members, Officers, and Servants of the Society. No existing Order or regulation of Council shall, however, be altered without one clear month's previous notice being given to each Member of the Council.

Appointment of Committees.

Committee.

Enter on duties.

22. The Council may appoint Standing and other Committees to superintend or examine into any special matters relating to the objects or business of the Society, and may require such Committees to Report, and may dissolve such Committees, whensoever they shall think proper. Standing Committees shall be appointed by the Monthly Council in December, but shall not enter on their respective duties until the first day of January, nor remain in office after the 31st of December of the ensuing year, unless re-appointed. Any other Committees, or additional Members of the Standing Committees may be appointed at a Monthly Council.

Disposal of Duplicates.

23. The Council may exchange for other property, or otherwise dispose of, any duplicate books, maps, or models belonging to the Society, in such manner as may in their opinion best conduce to the advancement of Agriculture and the interests of the Society.

Presentation of the Journal.

24. The Council may present copies of the Journal of the Society, to other agricultural and scientific bodies, and to the heads of public departments.

Appointment of Bankers.

25. The Council shall appoint a Banker to the Society, for the time being, to whom all sums of money received by the Secretary or any other person, for or on behalf of the Society, shall be paid.

Custody of Charter.

26. The Charter of the Society, Lease of the House, Secretary's Bond of Security, and other important documents belonging to the Society, shall be kept in a box confided to the custody of the Society's Bankers, and this box shall not be delivered up by them, excepting on a written order signed by the President or Chairman of Council Meeting, a Trustee, and the Secretary.

Common Seal.

27. The Common Seal of the Society shall be kept in a box with three different locks, the keys of which shall be respectively held by the President of the Society, the Chairman of the Finance Committee, and the Secretary. The Common Seal shall not be affixed to any instrument except in the Council-room during a Meeting of the Council, unless by their special order.

COMMITTEES.

Chairman.

28. Each Committee, at its first Meeting, shall elect its own Chairman for the year, who shall always take the chair at the Committee, when present; the chair being taken in his absence by a Chairman to be elected by the Committee for the occasion: and all Committees (except Finance Committees) shall meet by summons issued by direction of their respective Chairmen, or of the President, or of any three Members of the Committee, or by adjournment. The President, Trustees, and Vice-Presidents shall be Members *ex officio* of all Committees.

Summons.

Ex officio Members.

Reports of Committees.

29. All Committees during their sittings may report the progress of their proceedings to the Monthly Meetings of the Council, and shall sit till they have made their respective general reports; but in case such reports shall not have been made previously to the 31st of December next following their appointment, their powers shall then cease, unless renewed by a subsequent Council.

FINANCE.

Finance.

30. The Finance Committee shall have the immediate care of the Society's accounts, and be assisted by a professional Accountant, to be appointed and removed by them; and with the exception of any payment recommended, in the customary Report of the Finance Committee, no proposition involving the payment of money by the Society, if objected to by any Member of the Council present, shall be entertained by the Council without a month's previous notice. No money shall be drawn

Signature of Drafts.

from the Society's Banker but by cheques signed, at a meeting of the Council, by the President or Chairman, a Trustee, and the Secretary. A book shall be kept in which a consecutive entry shall be made of all such payments. The Finance Committee shall always meet, without summons, on the day of each Monthly Council.

Time of Meeting.

Audit.

31. Twice in every year—namely, not later than the Friday-week preceding each of the London General Meetings—there shall be an audit of the accounts of the Society, when a balance-sheet shall be prepared and reported to the General Meeting, and such balance-sheet shall be published in the ensuing part of the Journal. The Auditors shall consist of the President, the Trustees, the Members of the Finance Committee, and of three Members not being Members of the Council or of any of the Committees (of whom two shall always be present) to be chosen at the London General Meeting in December. A complete balance-sheet of the Country Meeting of each year shall appear in the first number of the Journal of the Society for the ensuing year.

Auditors.

Balance-sheet of Country Meeting.

JOURNAL.

Journal.

32. The Journal Committee shall have the superintendence of the editing, and care of the publication of the Journal; of which two parts shall be published every year, one in March, and one in September. They shall decide on the papers which shall be printed in the successive parts of the Journal, and as to the disposal of communications unsuitable for the immediate objects of the Journal. The Committee will exercise their discretion in the selection of matter, but neither they nor the Society will be responsible for the accuracy of the statements or conclusions contained in the several papers, the authors themselves being solely responsible for the latter. And it shall be assumed that all articles or cases submitted to the Society by any of its Members are so submitted with the view to publication if the Committee so think proper.

Non-responsibility of the Society.

SECRETARY.

Duties of Secretary.

33. The Secretary shall devote the whole of his time to the affairs of the Society, and shall be immediately responsible to the Council for the discharge of the various duties they require

him to perform. He shall attend the sittings of all Meetings of the Council. He shall also attend on any Committee requiring his presence, when not in attendance on the Council. He shall take the minutes of the Council; and also, when attending upon any Committee, the minutes of such Committee, if required to do so by the Chairman.

34. He shall conduct the correspondence of the Society, preserving the letters he may receive in a classified arrangement, and shall keep a daily register of correspondence in a classified form. He shall keep letter-books, in which copies of all letters shall be entered which he writes by direction of the President, Council, or Committees, or otherwise on the business of the Society. Correspondence.

35. Under the direction of the Finance Committee he shall be responsible for all moneys received at the rooms of the Society, paying such sums into the hands of the bankers, and producing at each meeting of the Finance Committee their receipts for the same; and, with the exception of the amount allowed him for petty cash, he shall not retain in his hands any money belonging to the Society, but shall pay it over forthwith to the Society's bankers. He shall have the charge of the expenditure of petty cash. Money.

36. All receipts for money received on behalf of the Society shall be out of a book with counterpart. Receipts.

37. All moneys received and paid shall be entered daily in a general cash-book. Cash-book.

38. He shall have the custody of all books, models, and papers belonging to the Society. All books, pamphlets, &c., sent to the Society shall be stamped with the Society's stamp at once.

39. He shall have the immediate superintendence over the Clerks and Servants of the Society; and shall be required to report to the Council any instances of misconduct on their part which he thinks of such a nature as to require the consideration of the Council. Superintendence of Clerks, &c.

40. Agreeably with the Charter, the Society may by him, as their Secretary, sue or be sued, and contract or discharge obligations, as the Council may from time to time direct. Power to sue and be sued.

41. He shall find approved security to the amount of 1000*l*. Security.

42. He shall be resident in the Society's house, unless by special permission of the Council. Residence.

Rooms.

43. The rooms of the Society shall not be underlet, unless by special permission of the Council.

44. He shall not be a Governor or a Member of the Society.

COPYRIGHT.

Copyright.

45. The copyright of all Essays gaining prizes shall belong to the Society, who shall accordingly have the power to publish the whole or any part of such Essays, and either in the Society's Journal or in any other way; and other Essays will be returned on the application of the writers; but the Society do not make themselves responsible for their loss, or for any injury that may happen to them.

LIBRARY.

Library.

46. The Library of the Society shall be under the charge of the Journal Committee, who shall decide as to the acceptance of all books, models, implements, seeds, or other donations offered to the Society, and cause a register to be kept of all donations accepted, and of the names of the donors.

COUNTRY MEETING AND SHOWS.

47. The entire risk and responsibility as regards the exhibition of all stock, implements, produce, and other articles, and in reference to all consequential or other injury or loss arising therefrom or thereto, shall be wholly borne by the exhibitor.

48. The Society shall not be in any way responsible for any claim for compensation or otherwise in regard to the holding, nor for anything arising out of or connected with their Shows.

Disqualification of Competitors.

49. The Council may exclude any person from competing for, or preclude him or her from receiving, any prize offered at any of the Society's Meetings who, in the judgment of the Council, has been guilty of any dishonest or unfair conduct either at or in connection with the Meeting in question, or any previous Meeting, whether of the Society's or otherwise.

50. The Judges shall not be bound to award a prize in any class where they may deem one undeserved.

BYE-LAWS.

51. All bye-laws, as soon as may be after being passed, shall be entered in a book to be kept for that purpose, and signed by the President and Secretary for the time being. Register of Bye-laws.

Passed at a Council held on the 8th of December, 1875.

(Signed) CHESHAM, President.
H. M. JENKINS, Secretary.

III.—RESOLUTIONS OF COUNCIL.

COUNCIL.

1. On the day the first Council in May, or an adjournment thereof, meets to prepare its Report to the General Meeting of the Society, a recommendation as to the election of President for the ensuing year shall be made by the Committee of Selection and considered by the Council. Recommendation of President for the ensuing year.

2. At every Monthly Meeting of the Council the Minutes of the previous Monthly and other intervening Meetings shall be first read, and postponed matters shall take precedence in the order of business of new motions, excepting in the case of a Report from the Finance Committee, which shall always be taken first into consideration, immediately after the Minutes have been read and the election of Members and proposal of candidates have taken place. Order of business.

3. The Reports from the Council to the General Meetings in London, in May and December, shall be prepared at the first Council-meetings, in those months, or at some adjournment thereof. Reports to General Meetings. The Secretary shall forward a copy of the draft half-yearly report to each Member of the Council with the Agenda-paper for the May and December Council-meetings. Half-yearly Report.

4. No motion or amendment shall be put to the Council unless it be written out at length, and signed by the Member proposing it. Motions and Amendments.

COMMITTEES.

Annual Report of Committees.

5. The standing Committees of each year shall make a written Report to the Monthly Council-meeting, in December, stating the number of times they have met, and the number of Reports they have made to the Council during the year for which they were appointed.

List of Members of Committees.

6. The annual report of each Standing Committee shall contain a list of its Members, mentioning those who have absented themselves during the whole year. It shall also contain the names of those proposed by such Committee to be added to the list for the ensuing year.

Committee of Selection.

7. The Committee of Selection shall consist of the President, the Chairmen of the Finance, Journal, Stock-Prizes, Implement, Country-meeting, and Chemical Committees, with six other Members of Council, of whom three shall retire annually, and not be eligible for re-election for three years. The duties of this Committee shall be, previous to the periodical expiration of the term of appointment of President, to consider and recommend to the Council of the Society, a Governor as President for the ensuing year, and on the occurrence of any casual vacancy in the list of Trustees or Vice-Presidents, to propose some Member of Council to supply such vacancy, and of some Governor or Member of the Society to fill any casual vacancy on the Council, having previously ascertained in all cases that the Members of Council, Governors or Members of the Society, so proposed, are prepared to accept such vacant offices. The Committee shall also recommend to the Council in each year a Steward of Stock, a Steward of Implements, and the Inspection Committee, having first ascertained that the Members of Council, whom they so recommend, are willing to accept these several appointments, and shall recommend a Steward of General Arrangements, when, and as often as, such appointment is required. The Secretary shall notify to the Council on the printed agenda-paper, any vacancy which shall occur in the list of Trustees, Vice-Presidents, or Members of Council, at the Meeting of the Council next after the happening of such vacancy, and such vacancy shall not be filled up until the Monthly Meeting of the Council which shall take place next after such notice.

Notification of vacancy.

FINANCE.

8. The Finance Committee shall prepare a Report on the state of the Society's funds, which they shall present to each Monthly Meeting, and lay before it the following accounts:—

Monthly Cash Account, ending

	£.	s.	d.		£.	s.	d.
Balance of petty cash in the hands of the Secretary last month . .				Payments by order of the Council . . .			
Balance at the bankers' .							
Amount of cash received during the past month by the Secretary, and paid into the London and Westminster Bank, as per bankers' receipts				Amount of expenditure of petty cash . . .			
Ditto, received by the London & Westminster Bank on account of the Society, as per bankers' book.				Balance in hand . . Bankers. . . . Secretary . . .			

and a statement of the payments recommended to be made, together with all the books in which entries of cash receipts or payments are made, and such documents as the business of the day may require. Should the Finance Committee not have met, the Secretary shall report the state of the Society's funds to the Council.

Life Compositions.

9. Also a statement every half-year of the compositions for life paid therein.

Quarterly Statement.

10. Also a Quarterly Statement of the state of the Society's Finances, showing 1st, a quarterly balance-sheet of receipts and expenditure; 2nd, a quarterly statement of property; 3rd, a quarterly statement of subscriptions and arrears made up to the last days of March, June, September, and December, and to be laid before the Council at the ensuing Monthly Meeting.

When made up.

Report on Income and Expenditure.

11. Also a special Report of the Income and Expenditure of the Society to the Council at its meeting in December, to assist the Council in fixing the maximum amount to be devoted to prizes at the ensuing Country Meeting.

Accountant.

12. The Accountant to the Society shall regularly examine

the Society's accounts, and report thereon to the Committee, as required by them.

REPORTING.

I. *Council Meetings:—For Society's use.*

Reporting.

13. The Secretary shall prepare notes of the business done at Council Meetings, and record the numbers of the majority and minority in case of division.

Attendance of Clerk.

14. In order to facilitate the preparation of such a Report the Secretary shall be assisted by one of his clerks, who shall attend the Council Meetings, and thus enable him to give his undivided attention to the business which is under consideration.

II. *Monthly Councils:—For the Press.*

Report for the Press.

15. The Secretary shall, subject to the direction of the Council, as soon as practicable after the rising of the Council, prepare a Report for the press, embodying all the decisions arrived at, stating the numbers by which each motion was affirmed or negatived, and giving the principal arguments used by the speakers.

Reports of Committees.

16. The substance of all Reports of Committees presented to the Council shall be published unless otherwise specially ordered by the Council.

Report of the Consulting Chemist.

17. The Consulting Chemist is required to submit to the Monthly Council, in March, June, and December, a report on the various samples of manures and feeding stuffs forwarded to him by Members of the Society; and such report, together with the names of the dealers who supplied the substances analysed, shall, if the Council think fit, be published in the Agricultural Journals.

III. *Interim Councils.*

Report of Interim Councils.

18. The Secretary shall prepare a Report of the proceedings of each Interim Council, which shall be furnished to the newspapers as soon as practicable after the conclusion of the Meeting, A *précis* of this Report shall be entered in the Minute Book. In cases where any written paper is read or laid before the Council, which is of too great length for immediate insertion in the Pro-

ceedings, it shall be referred to the Editor to report upon at the following Monthly Council.

COUNTRY MEETING.

19. The place of holding the Country Meeting shall not be decided upon until a Committee (of three Members, one at least of whom shall have acted as Director or Steward of the Yard at some previous Meeting) shall have visited and inspected such towns and their localities as the Council shall think fit, and have reported upon their respective suitableness for the purposes of the Society. **Inspection Committee.**

20. There shall be at least two Stewards appointed for regulating the entrances to the Show Yard at the Country Meeting, whose duties shall be to inspect from time to time the Register of the Turnstiles, and to see that the money taken out of the boxes corresponds with the sum indicated on the Register, making a note in a book kept for that purpose of the *time* at which such examination took place, and distinguishing whether there is any excess or deficiency in the amount shown on the Register. **Stewards of Finance.**

21. At the Country Meeting of the Society there shall be four Stewards for each department, viz.: four for the implements and four for the stock; one of whom only, in each department, shall go out of office at the end of the year, and another be appointed; so that three experienced Stewards may remain in office in each department. **Stewards.**

22. The Stewards shall endeavour, if possible, to decide all protests against the awards of the Judges at the Country Meeting, before the conclusion of the Meeting. Such protests shall be delivered at the Secretary's Office, in the Show Yard, before six o'clock on the Thursday evening of the Show-week; and no protest shall be *subsequently* received unless the Stewards be satisfied with the reasons assigned for the delay. **Protests.**

23. The Stewards shall have power to order any implement or animal out of the yard, the owner of which does not conform to the regulations of the Society or the directions of the Stewards. **Expulsion of Implements or Stock.**

24. No Member who has not paid his subscription for the current year is qualified to make an entry for the Country Meeting of the Society, or to exhibit as a non-subscriber. **Privileges of Entry.**

Free Admission to Show Yard.

25. Governors and Members of the Society who have paid their subscriptions for the current year shall be admitted to the Show Yard, during such time as the Council may determine, without payment, by tickets, which shall be issued by the Secretary, which tickets shall not be transferable; and any Governor or Member who shall transfer or lend his ticket shall pay a penalty of 5*l.*, to be recoverable by the Society as a debt, and, in addition, be liable to be dismissed from the Society.

Signature.

26. Each Member shall sign his name, and write his address, with a declaration of his Membership, on the back of the official ticket, and shall also sign his name in the Gate-book at the Members' Entrance, if required to do so.

Lodgings.

Payment of Judges.

27. Lodgings may be provided at the cost of the Society, during the Country Meeting. for the Stewards as well as for the Judges of Implements, the Consulting Engineer and assistants, and the Veterinary Inspectors with their assistant. Judges who are Members of Council may be paid as other Judges.

JUDGES.

Recommendation of Judges.

28. The Committee for the recommendation of Judges (hereafter called the Judges' Selection Committee) shall be appointed at the March Council; this Committee shall sit in April, and the absolute appointment of Judges shall take place at the May Council.

Judges nominated by Governors or Members.

Judges' Selection Committee.

29. Any Member of the Society who nominates a Judge shall certify that of his own personal knowledge he knows him to be qualified and willing to act as a Judge for whatever classes he may be proposed to be appointed. The list of names so proposed (stating by whom proposed) shall be referred to the Judges' Selection Committee of the Council, whereof the Stewards of the Yard of the year preceding shall be *ex officio* Members, provided they remain Governors or Members of the Society. In case of a sufficient number of competent persons not being proposed, the Committee may add the names of such other persons as they may know to be competent and willing to act.

Judges nominated by Members of Council.

30. A circular shall be sent in the first week of March to each Member of Council, requesting him to send to the Secretary, before the Monthly Meeting in April, the names of persons qualified and willing to act as Judges of Stock and Implements,

to serve as an additional list to the names sent in by the Members of the Society.

31. The list of names of persons recommended as Judges shall be placed in the Council-room, and a copy sent to each Member of Council two weeks before the Judges' Committee proceed to select the Judges; and any Member of the Society shall be at liberty to apply to the Secretary for a list of names, and to send in writing to the Secretary his objections to any name on the list, such objections to be laid before the Judges' Committee. List of names recommended.

JUDGES' REPORTS.

32. The Consulting Engineer may correct any inaccuracies in the description of the machinery, or the records of the working of the implements; but any alteration in the Report of a Judge of implements which is not included under either of the foregoing heads shall be submitted to the acting Senior Steward of Implements and the Chairman of the Journal Committee, and shall not be adopted without their approval. Error in description.

PRIZE-SHEETS.

33. The Prize Sheet for the Country Meeting shall be settled at the Council-meeting in December. Date of settling Prize Sheet.

PRIZE SHEET AND AWARDS.

34. No offer of a Prize by the Local Committee or private individual to be competed for at the Country Meeting of any year shall be taken into consideration by the Council after the first Wednesday in the month of February of such year of Meeting. Offer of Prize.

PRIZE-ESSAYS.

35. All information contained in Prize-Essays shall be founded on experience or observation, and not on simple reference to books or other writings. Information.

36. Drawings, specimens, or models, drawn or constructed to a stated scale, shall accompany writings requiring them. Illustrations.

37. All competitors shall enclose their names and addresses in a cover, on which only their motto, and the subject of their Essay, Motto.

and the number of that subject in the Prize list of the Society, shall be written.

Who to open.

38. The President or Chairman of the Council, for the time being, shall open the cover on which the motto designating the Essay to which the Prize has been awarded is written, and shall declare the name of the author.

Unsuccessful Essays.

39. The Chairman of the Journal Committee shall alone be empowered to open the motto-paper of such Essays, not obtaining the Prize, as he may think likely to be useful for the Society's objects, with a view of consulting the writer confidentially as to his willingness to place such paper at the disposal of the Journal Committee.

Conditions.

40. The Judges shall not be bound to award a prize unless they consider one of the Essays deserving of it.

(*b*). In all reports of experiments the expenses shall be accurately detailed.

(*c*). The imperial weights and measures only are those by which calculations are to be made.

(*d*). No prize shall be given for an Essay which has been already in print.

(*e*). Prizes may be taken in money or plate, at the option of the successful candidate.

(*f*). All Essays must be addressed to the Secretary, at the house of the Society.

APPENDIX No. I.

I of
(Post Town) in the county of
am desirous of becoming a Member of the ROYAL AGRICULTURAL SOCIETY OF ENGLAND, and engage, when elected, to pay the Annual Subscription of 1*l.*, or Life Composition of 10*l.*; and to conform to the rules and regulations of the Society until the termination of the year in which I shall withdraw from it by notice, in writing, to the Secretary.

(Signed) Candidate.
Date

Elected
Chairman.
Secretary.

APPENDIX No. II.

SIR,—I beg leave to inform you of your election as a of the ROYAL AGRICULTURAL SOCIETY OF ENGLAND, at a Monthly Council held on Wednesday, the 2nd of February, on the nomination of ; and of the Registration of your name under the official designation of , which, appended to your name, will at once form the key for immediate reference and identification, whether in your correspondence with the Society, or on payment of your Subscription through the Bankers; and you are therefore requested to favour the Society by adding it to your signature in all official communications.

On the remittance of your Annual Subscription of 1*l.*, or the Life Composition of 10*l.*—by means of a Money Order on *Vere Street, W.*, or of a cheque on a London Banker, made payable in either case to myself as Secretary of the Society (when an official receipt will be sent to you), or by payment into the St. James's Square Branch of the London and Westminster Bank, the Bankers of the Society (when due credit will be given to your account in the Society's books),—you will become entitled to the privileges of a Member of the Society, as established under the authority of the Charter and Bye-laws. By the Rules of the Society the Annual Subscription for the current year is payable on election, and afterwards becomes due in advance on the 1st of January in each succeeding year, until due notice of your resignation shall have been given me in writing, and all payments due from you at that time shall have been made; and the Journals will not be forwarded until the Annual Subscription or the amount of Life Composition shall have been received. The First Part of the Journal, to which you will be entitled after making one or other of those payments, is that published in .

Should any correction be required in your own designation, or in the address of this present letter, you will much oblige the Society by pointing it out.

I have the honour to be, Sir,
Your obedient servant,
H. M. JENKINS,
SECRETARY.

Royal Agricultural Society of England.

1876.

President.

LORD SKELMERSDALE.

Trustees.

Year when Elected.	
1855	ACLAND, Sir THOMAS DYKE, Bart., M.P., *Sprydoncote, Exeter, Devonshire.*
1857	BRIDPORT, Viscount, *Cricket St. Thomas, Chard, Somersetshire.*
1850	CHESHAM, Lord, *Latimer, Chesham, Bucks.*
1861	DENT, J. D., *Ribston Hall, Wetherby, Yorkshire.*
1863	KINGSCOTE, Colonel, M.P., *Kingscote, Wootton-under-Edge, Gloucestershire.*
1868	LICHFIELD, Earl of, *Shugborough, Staffordshire.*
1854	MACDONALD, Sir ARCHIBALD KEPPEL, Bt., *Woolmer Lodge, Liphook, Hants.*
1860	MARLBOROUGH, Duke of, K.G., *Blenheim Park, Oxford.*
1846	MILWARD, RICHARD, *Thurgarton Priory, Southwell, Notts.*
1839	PORTMAN, Viscount, *Bryanston, Blandford, Dorset.*
1856	POWIS, Earl of, *Powis Castle, Welshpool, Montgomeryshire.*
1858	RUTLAND, Duke of, K.G., *Belvoir Castle, Grantham, Leicestershire.*

Vice-Presidents.

1873	BEDFORD, Duke of, *Woburn Abbey, Bedfordshire.*
1861	CATHCART, Earl, *Thornton-le-Street, Thirsk, Yorkshire.*
1839	CHICHESTER, Earl of, *Stanmer Park, Lewes, Sussex.*
1867	DEVONSHIRE, Duke of, K.G., *Holker Hall, Lancashire.*
1847	EVERSLEY, Viscount, *Heckfield Place, Winchfield, Hants.*
1848	GIBBS, B. T. BRANDRETH, *Halfmoon Street, Piccadilly, London,* W.
1858	KERRISON, Sir EDWARD C., Bart., *Brome Hall, Scole, Suffolk.*
1839	MILES, Sir WILLIAM, Bart., *Leigh Court, Bristol, Somersetshire.*
1852	RICHMOND AND GORDON, Duke of, K.G., *Goodwood, Chichester, Sussex.*
1859	VERNON, Lord, *Sudbury Hall, Derby.*
1861	WELLS, WILLIAM, *Holmewood, Peterborough, Northamptonshire.*
1855	WYNN, Sir WATKIN WILLIAMS, Bart., M.P., *Wynnstay, Ruabon, Denbighshire.*

Other Members of Council.

1858	AMOS, CHARLES EDWARDS, 5, *Cedars Road, Clapham Common Surrey.*
1875	AVELING, THOMAS, *Rochester, Kent.*
1875	AYLMER, HUGH, *West Dereham, Stoke Ferry, Norfolk.*
1868	BOOTH, THOMAS CHRISTOPHER, *Warlaby, Northallerton, Yorkshire.*
1863	BOWLY, EDWARD, *Siddington House, Cirencester, Gloucestershire.*
1861	CANTRELL, CHARLES S., *Riding Court, Datchet, Bucks.*
1866	DAVIES, DAVID REYNOLDS, *Agden Hall, Lymm, Cheshire.*
1860	DRUCE, JOSEPH, *Eynsham, Oxford.*
1868	EDMONDS, WILLIAM JOHN. *Southrop, Lechlade, Gloucestershire.*
1871	EGERTON, Hon. WILBRAHAM, M.P., *Rostherne Manor, Knutsford, Cheshire.*
1867	ESLINGTON, Lord, M.P., *Ravensworth Castle, Durham.*

Year when Elected.	
1873	Evans, John, *Uffington, Shrewsbury, Salop.*
1875	Frankish, William, *Limber Magna, Ulceby, Lincolnshire.*
1874	Hemsley, John, *Shelton, Newark, Notts.*
1873	Horley, Thomas, Jun., *The Fosse, Leamington, Warwickshire.*
1866	Hornsby, Richard, *Spittle Gate, Grantham, Lincolnshire.*
1854	Hoskyns, Chandos Wren, *Harewood, Ross, Herefordshire.*
1871	Jones, J. Bowen, *Ensdon House, Shrewsbury, Salop.*
1848	Lawes, John Bennet, *Rothamsted, St. Albans, Herts.*
1869	Leeds, Robert, *Keswick Old Hall, Norwich.*
1872	Leicester, Earl of, K.G., *Holkham Hall, Wells, Norfolk.*
1874	Lindsay, Colonel Loyd, M.P., *Lockinge Park, Wantage, Berkshire.*
1865	Lopes, Sir Massey, Bart., M.P., *Maristow, Roborough, Devon.*
1871	MacIntosh, David, *Havering Park, Romford, Essex.*
1874	Martin, Joseph, *Highfield House, Littleport, Isle of Ely, Cambridgeshire.*
1871	Masfen, R. Hanbury, *Pendeford, Wolverhampton, Staffordshire.*
1875	Musgrave, Sir R. C., Bart., *Edenhall, Penrith, Cumberland.*
1857	Pain, Thomas, *The Grove, Basingstoke, Hants.*
1874	Pole-Gell, H. Chandos, *Hopton Hall, Wirksworth, Derbyshire.*
1861	Randell, Charles, *Chadbury, Evesham, Worcestershire.*
1875	Ransome, Robert Charles, *Ipswich, Suffolk.*
1871	Rawlence, James, *Bulbridge, Wilton, Salisbury, Wilts.*
1869	Ridley, M. White, M.P., *Blagdon, Cramlington, Northumberland.*
1861	Rigden, William, *Hove, Brighton, Sussex.*
1875	Russell, Robert, *Farningham, Dartford.*
1874	Sanday, George Henry, *Wensley House, Bedale, Yorkshire.*
1856	Shuttleworth, Joseph, *Hartsholme Hall, Lincoln.*
1872	Skelmersdale, Lord, *Lathom Hall, Ormskirk, Lancashire.*
1874	Spencer, Earl, K.G., *Althorp, Northampton.*
1875	Stratton, Richard, *The Duffryn, Newport, Monmouthshire.*
1873	Torr, John, M.P., *Carlett Park, Eastham, Chester.*
1874	Turbervill, Major Picton, *Ewenny Priory, Bridgend, South Wales.*
1845	Turner, George, *Brampford Speke, Exeter, Devonshire.*
1871	Turner, Jabez, *Haddon, Yaxley, Huntingdonshire.*
1871	Wakefield, William H., *Kendal, Westmoreland.*
1870	Welby-Gregory, Sir William Earle, Bart., M.P., *Newton House, Folkingham, Lincolnshire.*
1870	Whitehead, Charles, *Barming House, Maidstone, Kent.*
1865	Wilson, Jacob, *Woodhorn Manor, Morpeth, Northumberland.*
1875	Worsley, W. Cayley, *Hovingham, York.*

Secretary and Editor.

H. M. JENKINS, 12, *Hanover Square, London,* W.

Consulting Chemist—Dr. Augustus Voelcker, F.R.S., 11, *Salisbury Square,* E.C.

Consulting Botanist—W. Carruthers, F.R.S., F.L.S., *British Museum,* W.C.

Consulting Veterinary Surgeon—James Beart Simonds, *Royal Veterinary College, Camden Town,* N.W.

Officers of the Brown Institution, Wandsworth Road, S.W.—Dr. J. Burdon Sanderson, F.R.S., *Professor Superintendent;* W. Duguid, *Veterinary Inspector.*

Consulting Engineers—Eastons & Anderson, *The Grove, Southwark Street,* S.E.

Surveyor—George Hunt, *Evesham, Worcestershire.*

Seedsmen—Thomas Gibbs and Co., *Corner of Halfmoon Street, Piccadilly,* W.

Publisher—John Murray, 50, *Albemarle Street,* W.

Bankers—The London and Westminster Bank, *St. James's Square Branch,* S.W.

STANDING COMMITTEES FOR 1876.

Finance Committee.

Kingscote, Colonel (Chairman).
Bridport, Viscount.
Booth, T. C.
Randell, Charles.
Shuttleworth, J.

House Committee.

The President.
Chairman of Finance Committee.
Bridport, Viscount.
Cantrell, C. S.
Gibbs, B. T. Brandreth.

Journal Committee.

Dent, J. D. (Chairman).
Cathcart, Earl.
Spencer, Earl.
Vernon, Lord.
Hemsley, J.
Hoskyns, C. Wren.
Jones, J. Bowen.
Kingscote, Colonel.
Milward, Richard.
Ridley, M. White.
Welby-Gregory, Sir W. E., Bt.
Wells, W.
Whitehead, Charles.

Chemical Committee.

Wells, William (Chairman).
Bedford, Duke of.
Lichfield, Earl of.
Vernon, Lord.
Dent, J. D.
Hoskyns, C. Wren.
Jones, J. Bowen.
Lawes, J. B.
Martin, J.
Randell, C.
Russell, R.
Voelcker, Dr. A.
Wakefield, W. H.
Welby-Gregory, Sir W. E., Bt.
Whitehead, Charles.
Wilson, Jacob.

Botanical Committee.

Whitehead, Charles (Chairman).
Eslington, Lord.
Vernon, Lord.
Edmonds, W. J.
Frankish, W.
Gibbs, B. T. Brandreth.
Jones, J. Bowen.
Musgrave, Sir R.
Russell, R.
Turner, Jabez.
Voelcker, Dr.
Wells, W.

Veterinary Committee.

Egerton, Hon. Wilbraham (Chairman).
Bridport, Viscount.
Cathcart, Earl.
Booth, T. C.
Brown, Professor.
Carpenter, Dr.
Duguid, W.
Gibbs, B. T. Brandreth.
Kingscote, Colonel.
Lindsay, Colonel Loyd.
Milward, R.
Pole-Gell, H. Chandos.
Quain, Dr.
Ridley, M. White.
Sanderson, Dr. J. Burdon.
Simonds, Professor.
Wells, William.
Wilson, Jacob.

Stock-Prizes Committee.

Milward, Richard (Chairman).
Bridport, Viscount.
Aylmer, H.
Booth, T. C.
Bowly, Edward.
Dent, J. D.
Druce, Joseph.
Evans, John.
Gibbs, B. T. Brandreth.
Hemsley, J.
Horley, Thomas.
Leeds, Robert.
Lindsay, Colonel Loyd.
MacIntosh, D.
Martin, J.
Masfen, R. H.
Pain, T.
Pole-Gell, H. Chandos.
Randell, Charles.
Ridley, M. White.
Rigden, William.
Sanday, G. H.
Stratton, R.
Turner, George.
Wakefield, W. H.
Wilson, Jacob.
The Stewards of Live Stock.

Implement Committee.

Booth, T. C. (Chairman).
Bridport, Viscount.
Vernon, Lord.
Amos, C. E.
Aveling, T.
Cantrell, Chas. S.
Edmonds, W. J.
Evans, John.
Gibbs, B. T. Brandreth.
Hemsley, J.
Horley, T.
Hornsby, Richard.
Hoskyns, C. Wren.
Jones, J. Bowen.
Leeds, Robert.
Martin, J.
Masfen, R. H.
Milward, R.
Randell, Charles.
Sanday, G. H.
Shuttleworth, Joseph.
Turner, Jabez.
Welby-Gregory, Sir W. Earle, Bart.
Whitehead, Charles.
Wilson, Jacob.
The Stewards of Implements.

General Liverpool Committee.

Chesham, Lord (Chairman).
Bedford, Duke of.
Devonshire, Duke of.
Cathcart, Earl.
Bridport, Viscount.
Eslington, Lord.
Feversham, Lord.
Skelmersdale, Lord.
Vernon, Lord.
Musgrave, Sir R. C., Bt.
Wynn, Sir Watkin W., Bart.
Aveling, T.
Aylmer, H.
Booth, T. C.
Bowly, Edward.
Cantrell, Charles S.
Earle, Arthur.
Egerton, Hon. W.
Fletcher, Alfred.
Frankish, W.
Gibbs, B. T. Brandreth.
Hemsley, J.
Horley, T., Jun.
Hornsby, Richard.
Hubback, Joseph.
Jones, J. Bowen.
Leeds, Robert.
Liverpool, Mayor of.
Martin, J.
Masfen, R. H.
Milward, Richard.
Pole-Gell, H. C.
Randell, Charles.
Ransome, R. C.
Ridley, M. W.
Rigby, Thomas.
Sanday, G. H.
Shuttleworth, J.
Torr, J.
Turner, Jabez.
Wakefield, W. H.
Whitehead, Charles.
Wilson, Jacob.
Wyatt, Halifax.

Show-Yard Contracts Committee.

Randell, Charles (Chairman).
Bridport, Viscount.
Vernon, Lord.
Amos, C. E.
Booth, T. C.
Frankish, W.
Gibbs, B. T. Brandeth.
Horley, T.
Hornsby, Richard.
Milward, Richard.
Shuttleworth, Joseph.
Wilson, Jacob.

Committee of Selection.

Milward, R. (Chairman).
Cathcart, Earl.
Bridport, Viscount.
Egerton, Hon. W.
Randell, Charles.
Welby-Gregory, Sir W. E., Bt.
Wilson, Jacob.

And the Chairmen of the Standing Committees.

Education Committee.

Bedford, Duke of (Chairman).
Dent, J. D.
Jones, J. Bowen.
Kingscote, Colonel
MacIntosh, David.
Turberville, Major P.
Voelcker, Dr.
Wells, William.
Whitehead, Charles.
Worsley, W. Cayley.

Cattle Plague Committee.

The whole Council.

*** The President, Trustees, and Vice-Presidents are Members *ex officio* of all Committees.

Royal Agricultural Society of England.

GENERAL MEETING,

12, HANOVER SQUARE, MONDAY, MAY 22ND, 1876.

REPORT OF THE COUNCIL.

THE Council of the Royal Agricultural Society have to report that, since the last General Meeting in December, the following changes have taken place in the list of Members:—Two Governors and 58 Members have died, 135 Members resigned in the course of 1875, and the names of 20 others have been struck off the list by order of the Council. On the other hand, 2 Governors and 161 Members have been elected, so the Society now consists of:—

	83	Life Governors,
	78	Annual Governors,
	2164	Life Members,
	4013	Annual Members,
	11	Honorary Members,
Total - -	6349	

The Earl of Feversham has been elected a Member of the Council to fill the vacancy caused by the resignation of Mr. W. Cayley Worsley, of Hovingham, York.

The accounts for the year 1875 have been examined and certified by the Auditors and Accountants of the Society, and have been published in the last number of the 'Journal,' together with the statement of receipts and expenditure connected with the Taunton Meeting. The funded property of the Society remains the same as at the last General Meeting, namely 18,112*l.* 7*s.* 8*d.* New Three per Cents., and the balance of the current account in the hands of the bankers, on the 1st instant, was 2803*l.* 10*s.* 7*d.*; while the sum of 2000*l.* remained on deposit.

The Birmingham Meeting promises to be one of the largest yet held under the auspices of the Society; and the Local Committee are making every effort to afford the necessary accommodation, and generally to ensure the success of the Meeting.

The trials of Reaping Machines will be held at harvest-time on the Earl of Warwick's sewage-farm, at Heathcote, near

Leamington. Due notice of the date when they will commence will be given in the agricultural and local newspapers.

The district assigned for the Country Meeting in 1877 comprises the counties of Cumberland, Westmoreland, Lancaster, and the West Riding of Yorkshire. The Council received most cordial invitations from Carlisle, Liverpool, and Preston, and appointed a Committee to visit and report upon the sites and other accommodation offered. After considering the Report of this Committee, and conferring with representatives of the three localities, the Council finally decided that the Country Meeting for 1877 should be held at Liverpool.

The Council have to announce that, according to the rotation of districts which has recently been followed, the Country Meeting for 1878 falls to be held in the district comprising South Wales and the counties of Gloucester, Hereford, Monmouth, and Worcester; and it has been decided that a Show shall be held in the Metropolitan District in the year 1879, provided that suitable accommodation be found.

Since the last General Meeting an analysis and explanation of the Agricultural Holdings (England) Act, 1875, has been published in the 'Journal,' together with other illustrative communications, and a copy of the Act itself. On the motion of Mr. Randell, the Chemical Committee have considered by what means reliable *data* can be obtained for the guidance of valuers under the Act, in reference to unexhausted improvements of the third class, and have received the evidence of several scientific and practical witnesses on this subject. This evidence will be printed and circulated amongst the Members of the Society. Upon the recommendation of the Chemical Committee, the Council have resolved to accept the Duke of Bedford's offer of a farm at Woburn, where such experiments as may be determined upon may be carried out under the control of Mr. Lawes and Dr. Voelcker. The Duke of Bedford having not only allotted this farm to the use of the Council, but having also expressed his desire that the erection of the necessary buildings, and the subsequent cost of the experiments themselves, should be entirely at his expense, the Council have passed a cordial vote of thanks to the Duke of Bedford for his public-spirited offer. Pending the completion of those experiments, it is proposed to draw up, with the assistance of Mr. Lawes and Dr. Voelcker, a schedule of the manurial value of cakes and other feeding stuffs, and to publish the same for the use of valuers under the new Act.

The Council are glad to find that the circular letter respecting the precautions which should be taken by purchasers of manures and feeding stuffs, which was recently issued on the recommendation of the Chemical Committee, has been much appreciated by Members of the Society, and by the Committees of Agricultural Associations throughout the country.

The Lord President of the Privy Council having requested the Council to nominate a Judge for the important section of Agricultural Implements at the Philadelphia Centennial Exhibition, the Council have the pleasure to state that Mr. John Coleman, of Riccall Hall, York, has accepted their nomination, and has also undertaken, with the sanction of the British Commission, to write a Report on the Agricultural Features of the Exhibition for publication in the 'Journal' of the Society.

The Veterinary Privileges of Members of the Society have been revised in accordance with the terms of the recent arrangement with the Brown Institution; and a statement of them has been published as heretofore in the Appendix to the 'Journal.'

The Professor Superintendent of the Brown Institution (Dr. Burdon Sanderson) is at present engaged in making arrangements preliminary to a scientific investigation into pleuro-pneumonia and foot-and-mouth disease; and a series of pathological investigations into pleuro-pneumonia are also being prosecuted by Dr. Yeo, of King's College, under the direction of Dr. Burdon Sanderson. To defray the expenses of these important inquiries, the Council have granted a sum not exceeding 500*l.* for the current year.

The Examination of Candidates for the Society's Prizes and Certificates, including the Life-Membership of the Society, took place as usual at the Society's Rooms, from April 18th to 22nd inclusive. Out of six Candidates who had entered their names, only four (all from the Royal Agricultural College) presented themselves for examination. Of these, Mr. J. A. Maconchy, and Mr. D. J. Janasz gained a First-Class Certificate and the Life-Membership of the Society; the former also won the First Prize of 25*l.*, and the latter the Second Prize of 15*l.* Mr. A. Edwards and Mr. C. E. M. Russell obtained Second-Class Certificates.

By order of the Council,

H. M. JENKINS,

Secretary.

ROYAL AGRICULTURAL

Dr.

Half-yearly Cash Account

	£ s. d.	£ s. d.	£ s. d.
To Balance in hand, 1st January, 1876:—			
Bankers		179 9 9	
Secretary		49 5 4	
			228 15 1
To Income:—			
Dividends on Stock		260 8 5	
Subscriptions:—			
Governor's Life-Composition	20 0 0		
Governors' Annual	345 0 0		
Members' Life-Compositions	563 0 0		
Members' Annual	3,395 17 0		
		4,323 17 0	
Journal:—			
Sales		83 5 3	
Establishment:—			
Rent		200 0 0	
Veterinary:—			
Donation from the Glamorganshire Agricultural Society ..		10 0 0	
Sundries:—			
Sales of Specifications for Show-Yard Works		7 10 0	
Taunton Meeting		51 0 0	
Total Income		4,945 0 8	
To Birmingham Meeting		6,168 0 2	
			11,113 0 10
			£11,341 15 11

Balance-Sheet,

LIABILITIES.	£ s. d.	£ s. d.	£ s. d.
To Capital:—			
Surplus, 31st December, 1875		21,322 0 11	
Surplus of Income over Expenditure during the Half-year, viz.:—			
Income	4,945 0 8		
Expenditure	3,453 7 8		
		1,491 13 0	
			22,813 13 11
Less half-year's interest and depreciation on Country Meeting Plant		.. .. ..	172 0 7
			£22,641 13 4

QUILTER, BALL, & CO., *Accountants.*

SOCIETY OF ENGLAND.

FROM 1ST JANUARY TO 30TH JUNE, 1876.

CR.

	£	s.	d.	£	s.	d.	£	s.	d.
By Expenditure:—									
Establishment:—									
Salaries, Wages, &c.	567	0	0						
House:—Rent, Taxes, Repairs, &c.	340	10	11						
Office:—Printing, Postage, Stationery, &c.	315	3	9						
				1,222	14	8			
Journal:—									
Printing and Stitching	579	11	6						
Postage and Delivery	167	6	6						
Literary Contributions	139	8	0						
Woodcuts	5	18	0						
Lithographing	11	11	0						
Advertising	9	9	6						
				913	4	6			
Chemical:—									
Consulting Chemist's Salary	150	0	0						
Grant for Investigations	200	0	0						
Expenses incurred in taking notes of Evidence before Chemical Committee	50	4	0						
Printing ditto for use of Council	60	5	6						
Postage, &c., of ditto to Members	62	14	8						
				523	4	2			
Veterinary:—									
Royal Veterinary College, Half-year to Christmas, 1875	100	0	0						
The Brown Institution for Investigations	250	0	0						
				350	0	0			
Botanical:—									
Consulting Botanist's Salary				50	0	0			
Education:—									
Fees to Examiners	52	10	0						
Printing, Advertising, &c.	46	14	6						
Prizes	40	0	0						
				139	4	6			
Potato Disease Investigations:—									
Professor De Bary, balance for Paper				50	0	0			
Subscription (paid in error) returned				13	0	0			
Sundries:—									
Mounting in case Vote of Thanks to Mr. Gibbs	43	7	6						
Expenses of Inspection Committee	16	19	10						
Printing Specifications and Advertising for Tenders for Show-Yard Works	51	12	6						
				111	19	10			
Taunton Meeting				80	0	0			
Total Expenditure				..	..	..	3,453	7	8
By Capital Account:—									
Country Meeting Plant				80	13	0			
By Birmingham Meeting				3,843	10	10			
							3,924	3	10
By Balance in hand, 30th June:—									
Bankers	1,929	16	8						
Secretary	34	7	9						
				1,964	4	5			
At Deposit, London and Westminster Bank				2,000	0	0			
							3,964	4	5
							£11,341	15	11

30TH JUNE, 1876.

ASSETS.	£	s.	d.	£	s.	d.
By Cash in hand	1,964	4	5			
By New 3 per Cent. Stock 18,112*l.* 7*s.* 8*d.* cost*	17,340	7	1			
By Books and Furniture in Society's House	1,451	17	6			
By Country Meeting Plant	2,121	14	2			
By Deposit Account	2,000	0	0			
				24,878	3	2
Less at credit of Birmingham Meeting	..	..	..	2,236	9	10
				£22,641	13	4

* *Value at* 94⅛ = £17,044 7*s.* 6*d.*

Mem.—The above Assets are exclusive of the amount recoverable in respect of arrears of Subscription to 30th June, 1876, which at that date amounted to 1,505*l.*

Examined, audited, and found correct, this 21st day of August, 1876.

FRANCIS SHERBORN,
A. H. JOHNSON,
HENRY CANTRELL.
} *Auditors on behalf of the Society.*

SHOW AT BIRMINGHAM,

JULY, 1876.

STEWARDS OF THE YARD.

Stock.

William H. Wakefield,
Hon. W. Egerton, M.P.,
Joseph Shuttleworth,
William Wells,

Implements.

Jabez Turner,
J. Bowen Jones,
John Hemsley,
G. H. Sanday.

Forage.

Thomas Horley, Jun.

General Arrangements.

Jacob Wilson.

JUDGES OF STOCK.

HORSES.

Agricultural Horses.

G. M. Sexton,
A. Turnbull,
Samuel Wade.

Hunters and Thoroughbreds.

John B. Booth,
E. Foden,
T. Pain.

Hackneys, Ponies, &c.

Henry Beevor,
Hon G. E. Lascelles,
W. Parker.

CATTLE.

Shorthorns.

Richard Chaloner,
G. Drewry,
A. Mitchell.

Herefords.

G. W. Baker,
Thomas Fenn.

Devons and Sussex.

Samuel P. Newbury,
Henry Overman,
James Tremaine.

Jerseys and Guernseys.

J. Dumbrell,
C. P. Le Cornu.

Longhorns and Dairy Cattle.

M. Hewertson,
James Somerville,
B. Walker.

SHEEP.

Leicesters.

F. Spencer,
C. W. Tindall.

Lincolns and Cotswolds.

R. G. F. Howard,
Thomas Pollile

Southdowns, Hampshires, and Oxford Downs.

J. Bryan,
W. Bullen,
Henry Fookes.

Shropshires.

John Evans,
Henry Lowe,
R. H. Masfen.

PIGS.

Joseph Smith,
Matthew Walker,
A. Warburton.

Veterinary Inspectors.

Professor Brown,
R. L. Hunt.

Inspectors of Shearing.

W. Jobson,
J. B Workman.

JUDGES OF BUTTER AND CHEESE.

S. Walker Cox,
H. Chandos Pole-Gell,
James Watson.

JUDGE OF WOOL.

John W. Mayou.

JUDGES OF IMPLEMENTS.

Reaping Machines.

Major Grantham,
J. W. Kimber,
Thomas Rigby.

Miscellaneous, &c.

John Hicken,
J. D. Ogilvie,
John Thompson.

FARM JUDGES.

William Holtom,
G. Laing,
H. J. Little.

AWARD OF PRIZES.

Note.—The Judges were instructed, in addition to awarding the Prizes, to designate as the *Reserve Number* one animal in each Class, next in order of merit, if it possessed sufficient for a Prize; in case an animal to which a Prize was awarded should subsequently become disqualified.

Prizes given by the Birmingham Local Committee are marked thus (*).

HORSES.

Agricultural Stallions—Two Years old.

The Earl of Ellesmere, Worsley Hall, Manchester: First Prize, 20*l*., for "Young Waggoner," bay; bred by Mr. D. Vauser, March, Cambridgeshire; sire, "Waggoner;" dam, "Princess," by "Major."

James Firth Crowther, Knowle Grove, Mirfield, Yorkshire: Second Prize, 10*l*., tor "Carleton Tom," bay; bred by Mr. T. Rigby, Carleton Grange, Poulton-le-Fylde; sire, "Honest Tom;" dam by "Bay Kirby."

The Rev. James Spencer Northcote, St. Mary's College, Oscott, Birmingham, Third Prize, 5*l*., for his bay; bred by himself; sire, "A 1;" dam, "Darling."

Thomas Statter, Stand Hall, Manchester: the *Reserve Number*, to "Plough-Boy," brown; bred by the late Mr. W. Nix, Somersham; sire, "Young Farmer."

Agricultural Stallions foaled before the 1st of January, 1874.

William Wynn, Ryon Hill Farm, Stratford-on-Avon: First Prize, 20*l*., for "Nonpareil," bay, 8 years-old; bred by Mr. G. Malin, Harvington, Evesham; sire, "A 1;" dam, "Matchless, by "King of the Valley."

Thomas Statter, Stand Hall, Manchester: Second Prize, 10*l*., for "Young Champion," chestnut, 8 years-old; bred by Mr. Stokes, Caldecot, Rockingham; sire, Stokes's "Champion."

Charles Marsters, Saddlebow, King's Lynn: Third Prize, 5*l*., for "England's Wonder," strawberry roan, 5 years-old; bred by Mr. C. Wincals, Wisbech.

Thomas Briggs, Cott Farm, Babraham, Cambridge: the *Reserve Number*, to "Heart of Oak," bay, 5 years-old; bred by Mrs. Foster, Brooklands Farm, Cambridge; sire, "Honest Tom;" dam, "Smiler," by "Inkerman."

*Agricultural Stallions.**

*** The winner of the First Prize to travel in North Warwickshire Parliamentary division, to stand one day each week in season 1877 at Birmingham, and one day at Warwick.

*** The winner of the Second Prize to travel in South Warwickshire Parliamentary division, and to stand one day each week in season 1877 at Warwick.

FREDERICK STREET, Somersham Park, St. Ives, Hunts: FIRST PRIZE, 60*l.*, for "Young Samson," bright bay, 5 years-old; bred by the late Mr. Richardson, Chatteris, Cambridgeshire; sire, "Samson;" dam by "Old Major."

MESSRS. YEOMANS, Pennymore Hay, Four Ashes, Wolverhampton: SECOND PRIZE, 40*l.*, for "Pride of England," bay, 8 years-old; bred by Mr. B. Williams, Glenavron, Montgomeryshire; sire, "Conquering Hero."

WILLIAM BARBER, Congerstone, Atherstone, and EDWIN JOHN FOXWELL, Manor House, Hinckley: the *Reserve Number*, to "Oxford Blue," grey, 4 years-old; bred by Mr. W. Jones, Rockingham; sire, "Rutland Hero;" dam by "Old Waxwork."

Clydesdale Stallions—Two Years old.

LAWRENCE DREW, Merryton, Hamilton, Lanarkshire: FIRST PRIZE, 20*l.*, for his black; bred by himself; sire, "Prince of Wales;" dam, "Mary."

THE DUKE OF RICHMOND AND GORDON, K.G., Goodwood, Chichester: SECOND PRIZE, 10*l.*, for "Albert Edward," brown; bred by Mr. L. Drew, Merryton; sire, "Prince of Wales;" dam, "Old Mallie," by "Young Campsie."

JAMES GRAHAM, Parcelstown, Longtown, Cumberland: THIRD PRIZE, 5*l.*, for "Baron Lonsdale," dark bay; bred by the late Mr. Hodgson, M.P., Newby Grange, Carlisle; sire, "Lord Clyde;" dam, "Jenny."

THE DUKE OF RICHMOND AND GORDON, K.G.: the *Reserve Number*, to "The Earl," brown; bred by Mr. A. Newman, Selhurst Park, Chichester; sire, "Duke."

Clydesdale Stallions foaled before the 1*st of January*, 1874.

JAMES FORSHAW, Blyth, Worksop, Notts: FIRST PRIZE, 20*l.*, for "Ben Lomond," black, 5 years-old; bred by Mr. R. Mackie, Dalkeith, N.B.; sire, "Prince of Wales;" dam by "Gastevine."

THOMAS TAGG, Newhall, Burton-on-Trent: SECOND PRIZE, 10*l.*, for "Young Lofty," bay, 15 years-old; bred by Mr. J. Clarke, Mansurae, Kilbarchan, N.B.

LIEUT.-COLONEL R. LOYD-LINDSAY, V.C., M.P., Lockinge Park, Wantage, Berks: THIRD PRIZE, 5*l.*, for "Prince Albert," bay, 8 years-old; bred by Mrs. Snodgrass, Clockkiel, Campbeltown, N.B.; sire, "Largs Jock;" dam by "Old Scotchman."

Suffolk Stallions—Two Years old.

RICHARD GARRETT, Carleton Hall, Saxmundham: FIRST PRIZE, 20*l.*, for his chestnut; bred by Mr. C. Frost, Wherstead, Ipswich; sire, "Cupbearer the Second;" dam by "Sir Colin."

JAMES TOLLER, Blaxall, Wickham Market: SECOND PRIZE, 10*l.*, for "The Evergreen," chestnut; bred by Mr. C. Frost, Wherstead; sire, "Statesman;" dam by "Chester Emperor."

ALFRED CRACKNELL, The Grove, Thornham, Eye, Suffolk: THIRD PRIZE, 5*l.*, for "Champion," chestnut; bred by himself; sire, Spelman's "Ploughboy;" dam, "Smart," by Sir E. Kerrison's "Champion."

MANFRED BIDDELL, Playford, Ipswich: the *Reserve Number*, to "Jasper," chestnut; bred by Mr. Edgar, Rougham, Bury St. Edmunds; sire, "Son of Cupbearer."

Suffolk Stallions foaled before the 1st *of January*, 1874.

HORACE WOLTON, Newbourn Hall, Woodbridge, Suffolk: FIRST PRIZE, 20*l.*, for "Royalty," chestnut, 5 years-old; bred by himself; sire, "Magnum Bonum;" dam, "Duchess," by "Warrior."

RICHARD GARRETT, Carleton Hall, Saxmundham: SECOND PRIZE, 10*l.*, for "Viceroy," dark chestnut, 3 years-old; bred by himself; sire, "Monarch."

SIR RICHARD WALLACE, Bart., M.P., Sudbourne Hall, Wickham Market: THIRD PRIZE, 5*l.*, for "Prince Imperial," chestnut, 3 years-old; bred by the late Colonel Wilson, Stowlangtoft, Bury St. Edmunds; sire, "Heir Apparent;" dam, "Bury Empress," by "Harwich Emperor."

WILLIAM BYFORD, The Court, Glemsford, Suffolk: the *Reserve Number*, to "Active," chestnut, 4 years-old; bred by Mr. J. H. Button, Thetford, Norfolk; sire, Mr. Cook's "Emperor," dam by Mr. Crisp's "Duke."

Thoroughbred Stallions suitable for getting Hunters.

THOMAS GEE, Dewhurst Lodge, Wadhurst, Hawkhurst, Kent: FIRST PRIZE, 50*l.*, for "Citadel," chestnut, 17 years-old; bred by the Earl of Derby, Knowsley; sire, "Stockwell;" dam, "Sortie," by "Melbourne."

HENRY HART, Balmacarrow, Killyleigh, Co. Down, Ireland: SECOND PRIZE, 20*l.*, for "Waddington," brown, 12 years-old; bred by the late Mr. W. Cappe, Waddington Park, Leicestershire; sire, "Snowden-dunhill;" dam, "Radiance," by "Rataplan."

JOHN REES, Llanboidy, Whitland, R.S.O.: THIRD PRIZE, 10*l.*, for "The Swift," bay, 9 years-old; bred by Mr. Blenkiron, Middle Park, Eltham, Kent; sire, "Blair Athol;" dam, "Terrific," by "Touchstone."

Stallions suitable for getting Hackneys, not exceeding 15 *hands* 2 *inches.*

BENJAMIN BALDERSTON, Mount Pleasant, Boston, Lincolnshire: FIRST PRIZE, 20*l.*, for "Norfolk Hero," dark brown, 9 years-old; bred by Mr. Mason, Wereham, Norfolk; sire, "Perfection."

THOMAS STATTER, of Stand Hall, Manchester: SECOND PRIZE, 10*l.*, for "Perseverance," black, 4 years-old; bred by Mr. Dunham, Wymondham, Norfolk; sire, "Confidence."

HENRY ROUNDELL, Queen's Head Hotel, Otley, Yorkshire: THIRD PRIZE, 5*l.*, for "Sir George Wombwell," brown, 4 years-old; bred by Mr. Joshua Yeadon, Fewston, Otley; sire, "Sir George;" dam by "Grey Atlas" or "Matchless Merrylegs."

FRANCIS RIDGLEY AND CO., Holly Hill Farm, Enfield, Middlesex: "Fireaway the Second," awarded Second Prize, but disqualified on account of being over the height.

Pony Stallions, not exceeding 14 *hands.*

JAMES POWELL, Butlington Hall, Welshpool, Montgomeryshire: FIRST PRIZE, 20*l.*, for "Almanza," rich brown, 3 years-old; bred by himself; sire, "Alonzo;" dam by "Steamer."

SAMUEL LANG, Henbury, Bristol: SECOND PRIZE, 10*l.*, for "Lad of Mancombe," dark brown, 6 years-old; bred by Mr. Marfleet, Newark; sire, "Red Cross Knight;" dam by "Tomtit."

CHRISTOPHER JOHN HUME TOWER, Weald Hall, Brentwood: THIRD PRIZE, 5*l.*, for "Tricstrin," dun, aged; breeder unknown.

WILLIAM EDWARD OAKELEY, Cliffe House, Atherstone: the *Reserve Number*, to "Llanderfel," brown, 8 years-old; breeder unknown.

Agricultural Mares and Foals.

CHARLES BEART, Westhead Farm, Stow, Downham Market: FIRST PRIZE, 20*l.*, for "Lioness," chestnut, 4 years-old (foal by Wiseman's "Wonder"); bred by Mr. B. Morris, Stone Bridge Farm, Thorney, Cambridgeshire; sire, Manning's "Nonpareil."

GEORGE STREET, Maulden, Ampthill, Bedfordshire: SECOND PRIZE, 10*l.*, for "Cardiff Lass," red roan, 6 years-old (foal by Stokes's "Young Champion"); bred by himself; sire, "Young Britain;" dam, "Brown."

THOMAS HORROCKS MILLER, Singleton Park, Poulton-le-Fylde: THIRD PRIZE, 5*l.*, for "Princess of Wales," bay, 4 years-old (foal by "Honest Tom"); bred by Mr. Edward Parkinson, Forton, Lancaster; sire, "King Alfred;" dam, "Bessie," by "Tom o' the Gills."

THE EARL OF ELLESMERE, Worsley Hall, Manchester: the *Reserve Number*, to "Honest Lass," bay, 6 years-old (foal by Stokes's "Champion"); bred by Mr. I. L. Curtis, Chatteris; sire, "Honest Tom;" dam, "Pink."

Clydesdale Mares and Foals.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 20*l.*, for "Mrs. Muir," bay, 10 years-old (foal by "King Tom"); bred by Mr. Muir, Loch Fergus, Kirkcudbright; sire, "Champion."

LIEUT.-COL. LOYD-LINDSAY, V.C., M.P., Lockinge Park, Wantage: SECOND PRIZE, 10*l.*, for "Darling," bay, 12 years-old (foal by "Prince Albert"); bred by Mr. Mair, Udderstone, Mid-Calder.

Suffolk Mares and Foals.

HORACE WOLTON, Newbourn Hall, Woodbridge, Suffolk: FIRST PRIZE, 20*l.*, for "Pride," bright chestnut, 8 years-old (foal by "Royalty"); bred by Mr. S. Wolton, sen.; sire, "Monarch;" dam, "Pride."

*Agricultural Geldings or Fillies—Four Years old.**

WILLIAM BRAMLEY, Amcotts Villa, Doncaster: FIRST PRIZE, 20*l.*, for "The General," bay gelding; breeder unknown.

JOHN GIBBS, Wychbold, Droitwich, Worcestershire: SECOND PRIZE, 10*l.*, for "Merryman," red roan gelding; bred by himself.

*Agricultural Geldings or Fillies—Three Years old.**

HENRY SMITH, The Grove, Cropwell Butler, Bingham: FIRST PRIZE, 20*l.*, for "The Major," dark chestnut gelding; bred by Mr. J. B. Smith, Sawley, Derby; sire, Burrow's "Lincolnshire Lad;" dam, "Jewell," by Styche's "Champion."

HENRY PULLEINE, Baxter Hall, Drax, Selby, Yorkshire: SECOND PRIZE, 10*l.*, for "Patch," black filly, bred by himself; sire, "Farmer's Profit."

THE EARL OF ELLESMERE, Worsley Hall, Manchester: THIRD PRIZE, 5*l.*, for his bay filly; bred by Mr. Doughty, Laton Garnsgate, Lincolnshire; sire, "Young Thumper;" dam by "Thumper."

Clydesdale Fillies—Three Years old.

LAWRENCE DREW, Merryton, Hamilton, Lancashire: FIRST PRIZE, 15*l.*, for his brown; breeder unknown.

THE EARL OF STRATHMORE, Glamis Castle, Glamis, Forfar: SECOND PRIZE, 10*l.*, for "Nell," bay; bred by Mr. John Thomson, Little Inch, Kirriemuir, Forfar; sire, "Young Sir Colin;" dam, "Jess," by "Champion."

Suffolk Fillies—Three Years old.

WILLIAM BYFORD, The Court, Glemsford, Suffolk: FIRST PRIZE, 15*l.*, for "Empress," chestnut; bred by himself; sire, "Volunteer;" dam, "Matchet," by "Hero."

JAMES TOLLER, Blaxall, Wickham Market: SECOND PRIZE, 10*l.*, for "Empress," chestnut; breeder unknown; sire, "Farmer."

*Agricultural Geldings or Fillies—Two Years old.**

CHARLES MARSTERS, Saddlebow, King's Lynn: FIRST PRIZE, 20*l.*, for "Marchioness," strawberry roan filly: bred by himself.

HENRY SMITH, The Grove, Cropwell Butler, Bingham: SECOND PRIZE, 10*l.*, for "Robin Hood," bay gelding; bred by Mr. Thomas Porter, Socko Park, Derby; sire, "Waxwork;" dam, "Flower," by "Uncle Tom."

HENRY TOMLINSON, Lee Lane, Rugeley; THIRD PRIZE, 5*l.*, for bay filly; bred by himself; sire, "Pride of England;" dam by "Champion."

WILLIAM WELCHER, Snare Hill Park, Thetford, Norfolk: the *Reserve Number*, to "Royal Princess," black filly; bred by himself; sire, "Prince of Wales;" dam, "Smart," by "Honest Tom."

Clydesdale Fillies—Two Years old.

WILLIAM DREWITT, Lea Farm, Bramley, Guildford: FIRST PRIZE, 15*l.*, for "Rose of England," bay; bred by Messrs. E. and A. Stanford, Eatons, Steyning; sire, "The Duke;" dam, "Venture."

LAWRENCE DREW, Merryton, Hamilton, Lanarkshire: SECOND PRIZE, 10*l.*, for his brown; breeder unknown.

EDWARD AND ALFRED STANFORD, of Eatons, Ashurst, Steyning, Sussex: the *Reserve Number*, to "Maggie," black; bred by Mr. Frederick Hammond, Wappingthorne, Steyning; sire, "The Duke;" dam by "Young Sampson."

Suffolk Fillies—Two Years old.

WILLIAM TOLLER, Gedgrave, Wickham Market: FIRST PRIZE, 15*l.*, for "Ada," chestnut; bred by Mr. W. Lines, Bredfield, Woodbridge; sire, "Monarch;" dam by Catlin's "Duke:" and SECOND PRIZE, 10*l.*, for "Myrtle," chestnut; bred by himself; sire, "Grouts Emperor;" dam, "Scot," by "Briton."

William Byford, The Court, Glemsford, Suffolk: the *Reserve Number*, to "Moggie," chestnut; bred by himself; sire, "Volunteer;" dam, "Moggie," by "Duke."

*Agricultural Geldings and Fillies—One Year old.**

The Earl of Ellesmere, Worsley Hall, Manchester: **First Prize**, 15*l.*, for his bay filly; bred by Mr. Beart, Wisbech; sire, "Honest Tom the Second;" dam, by "Wiseman's Wonder."

John Walter, M.P., Bearwood, Wokingham: **Second Prize**, 10*l.* for "Princess," chestnut filly; bred by himself; sire, "Young Briton;" dam, "Pink."

Thomas Horrocks Miller, Singleton Park, Poulton-le-Fylde: **Third Prize**, 5*l.*, for "Hebe," bay filly; bred by himself; sire, "Honest Tom;" dam, "Brisk."

Stephen Davis, Woolashill, Pershore: the *Reserve Number*, to his bay filly; bred by himself; sire, "General;" dam, "Pleasant," by "Rowland."

Mares and Foals, suitable for breeding Hunters.

Thomas Horrocks Miller, Singleton Park, Poulton-le-Fylde: **First Prize**, 20*l.*, for "Flora," grey, 13 years-old (foal by "Carbineer"); breeder unknown; sire, "Ellington;" dam, "Clotilde," by "Pyrrhus I."

Viscount Falmouth, Tregothnan, Probus, Cornwall: **Second Prize**, 10*l.*, for "Bowling-green," dark brown, 9 years-old (foal by "Young Dutchman"); bred by himself; sire, "Seneschal;" dam, "Fairlawn."

Messrs. Stagg and Tyler, Cedar Villa, Balsall Heath, Birmingham: **Third Prize**, 5*l.*, for "Miss Saurin," brown, 7 years-old (foal by "Brown Bread"); bred by Mr. N. H. Stagg, Cedar Villa; sire, "Calsterdale;" dam, "Lady Abbess," by "Surplice."

Charles Rowland Liddle, Highfield, Newport, Salop: the *Reserve Number*, to "Insecurity," brown, 5 years-old (foal by "De Clare"); bred by himself; sire, "Gunboat;" dam, "Bad Debt," by "Vedette."

Mares and Foals, suitable for breeding Hackneys.

Alexander Sherratt, Oclepitchard, Hereford: **First Prize**, 20*l.*, for "Polly," dark chestnut, 17 years-old (foal by "Truant"); bred by the Rev. C. L. Eagles, Longtown, Abergavenny; sire, "Hereford;" dam, "Fanny."

Thomas Cook, Hull: **Second Prize**, 10*l.*, for "Portia," bay, 5 years-old; bred by Mr. F. Cook, Riggs, Fridaythorpe, York; sire, "Bay President;" dam, "Evening Star," by "Wildfire."

Thomas Kingsley, Boar's Croft, Tring, Herts: **Third Prize**, 5*l.*, for "Kitty," brown, 7 years-old; bred by himself; sire, "Baron Leno;" dam, "Old Kitty."

George David Badham, the Lawn, Bulmer, Sudbury: the *Reserve Number*, to "Gipsy," black, 4 years-old (foal by "Little Pippin"); bred by himself; sire, "Adonis;" dam, "Zoe."

Pony Mares and Foals, not exceeding 14 hands.

Benjamin Gill, Wallace Street, Round Oak, Brierley Hill, Staffordshire:

First Prize, 15*l.*, for "Pet," chestnut, 7 years-old (foal by "Duke"); bred by Mr. D. Miller, Chorney Hill, Stourbridge.

William Coater, Scarborough Farm, Winchcombe: Second Prize, 10*l.*, for "Kitty," chestnut, 11 years-old (foal by "Dexter"); bred by himself; dam by "Douglas."

Clement Whitehead Griffin, Werrington, Peterborough: Third Prize, 5*l.*, for "Sally," grey, 8 years-old (foal by "Young Quicksilver"); bred by the Rev. Mr. Barnwell, late of Deeping, Lincolnshire.

Hunter Fillies—Two Years old.

John Rickerby, Wall Head, Carlisle: First Prize, 15*l.*, for "Young Kate," chestnut; bred by himself; sire, "Laughing Stock;" dam, "Bonnie Kate," by "Clansman."

Robert Baskerville Mynors, Treago, Ross: Second Prize, 10*l.*, for "Mignonette," brown; bred by himself; sire, "Double X;" dam "Bosberina."

Roger Bowling, Barrow Howle, Lancaster: the *Reserve Number*, to "The Queen," chestnut; bred by Mr. E. Barton, Warton Glamey, Lancaster; sire, "Laughing Stock;" dam, "Duchess."

Hunter Mares—Three Years old.

John Musgrave Tattersall-Musgrave, Beverley, Yorkshire: First Prize, 15*l.*, for "Triumph," chestnut; bred by Mrs. Jackson, Riston Grange, Leven, Beverley; sire, "Theobald;" dam by "Galaor."

James T. Darrell, West Ayton, York: Second Prize, 10*l.*, for "Belona," dark grey; bred by Mr. Leonard Thompson, Sheriff Hutton, York; sire, "King Caradoc;" dam, "Marigold," by "Gay Necromancer."

James Moffat, Low Crosby-on-Eden, Carlisle: the *Reserve Number*, to "Rosalind," brown; bred by Mr. W. R. J. Piper, Alstonby, Carlisle; sire, "Laughing Stock;" dam, "Lady Lyne," by "Coddington."

*Hunter Geldings—Two Years old.**

The Duke of Hamilton, Easton Park, Wickham Market: First Prize, 15*l.*, for "Boynton," bay; bred by the late Sir George Cholmley, Boynton, Bridlington, Yorkshire; sire, "The Baron;" dam, "Pulley-Hauley," by "King Caradoc."

William Edward Oakeley, Cliff House, Atherstone: Second Prize, 10*l.*, for "Bird Tenter," chestnut; bred by himself; sire, "Watchman;" dam, "Country Cousin."

John Jackson Banks, Lanefoot, Kendal: the *Reserve Number*, to "Rural Dean," chestnut; bred by himself; sire, "The Dean;" dam, "Rosette," by "Harkaway."

*Hunter Geldings—Three Years old.**

John Rickerby, Wall Head, Carlisle: First Prize, 15*l.*, for "Captain," chestnut; bred by himself; sire, "Laughing Stock;" dam, "Bonnie Kate," by "Clansman."

Henry J. Bailey, Rosedale, Tenbury: Second Prize, 10*l.*, for "Precocity," brown; bred by himself; sire, "Double X;" dam, "Sybil."

Thomas Watson, Whitacre, Coleshill, Warwickshire: the *Reserve Number*, to "Sportsman," chestnut; bred by the late Mr. G. Turner, Water Orton, Coleshill; sire, "Glenlyon;" dam by "Vivod."

Hunter Mares—Four Years old.

John Cooper, Overstone, Northampton: First Prize, 25*l.*, for "Countess," chestnut; breeder unknown; sire, "Gavizzi;" dam by "West Australian."

Teasdale Hilton Hutchinson, Manor House, Catterick, Yorkshire: Second Prize, 15*l.*, for "May Queen," brown; bred by the Rev. W. Wharton, Gilling Rectory, Richmond, Yorkshire; sire, "Honesty."

Thomas Mansell, Ercall Park, Wellington, Salop: the *Reserve Number*, to "Liberty," bright bay; bred by the late Mr. William Davis, Grafton, Shrewsbury; sire, "Gin;" dam by "Steamer."

Hunter Geldings—Four Years old.

Frederick Barlow, Hasketon, Woodbridge, Suffolk: First Prize, 25*l.*, for "Van Dyck," brown bay; bred by Mr. George Meynell, Patrick Brompton, Bedale; sire, "Van Galen;" dam by "Barnton."

Teasdale Hilton Hutchinson, Manor House, Catterick: Second Prize, 15*l.*, for "Glengyle," chestnut; bred by Mr. Russell Swanwick, College Farm, Cirencester; sire, "Knowsley;" dam, "The Pet."

Frederick B. Jones, Westall Court Farm, Cheltenham: Third Prize, 10*l.*, for his black; breeder unknown; sire, "Gemma;" dam by "Gallant."

Henry Hone, Stoke Orchard, Cheltenham: the *Reserve Number*, to his chestnut; breeder unknown.

Hunter Mares or Geldings, Five Years-old and upwards, up to not less than 12 stone.

Teasdale Hilton Hutchinson, Manor House, Catterick: First Prize, 30*l.*, for "The Jester," brown gelding, 7 years-old; bred by Mr. Thomas Gibbons, Burnfoot, Carlisle; sire, "Laughing Stock;" dam by "Rowland."

William Whitehead, Wollaston, Wellingborough: Second Prize, 20*l.*, for "Harkaway," brown gelding, 6 years-old; breeder unknown; sire, "King Caradoc;" dam by "Muley."

Frederick Barlow, Hasketon Shrubbery, Woodbridge: Third Prize, 10*l.*, for "King Charming," black brown gelding, 7 years-old; bred by Mr. Mason, Dishforth, Boroughbridge, Yorkshire; sire, "Ainderby; dam by "Theon."

T. Henry Ashton, Temple Laugherne, Worcester: the *Reserve Number*, to "The Lancer," chestnut gelding, aged; breeder unknown; sire, "Mowbray."

Hunter Mares or Geldings, Five Years-old and upwards, up to not less than 14 stone.

The Duke of Hamilton, Easton Park, Wickham Market: First Prize, 30*l.*, for "Winder," black gelding, 8 years-old; breeder unknown.

T. Harvey D. Bayly, Edwinstowe House, Ollerton, Notts: Second Prize, 20*l.*, for "Rossington," bay gelding, aged; breeder unknown; sire, "Cain;" dam by "Canute."

WILLIAM WHITEHEAD, Wollaston, Wellingborough: THIRD PRIZE, 10*l.*, for "The Old Squire," brown gelding, 5 years-old; breeder unknown; sire, "Clear the Way;" dam by "Lord Ribblesdale."

ROBERT NEEDHAM PHILIPS, M.P., Welcombe Hall, Stratford-on-Avon: the *Reserve Number*, to his dark bay gelding, 7 years-old; breeder unknown.

Hunters, Four Years-old and upwards, not exceeding 15 *hands* 2 *inches.**

ALFRED DARBY, Little Ness, Shrewsbury: FIRST PRIZE, 20*l.*, for "Gloucester," bay gelding, 5 years-old; bred by Mr. LEWIS, Great Ness, Shrewsbury; sire, "De Clare."

HENRY WILLIAM PRATT, Owlington Farm, Kineton, Warwickshire: SECOND PRIZE, 10*l.*, for "Dandy," chestnut gelding, 5 years-old; bred by himself; sire, "Danube;" dam, "Gipsy," by "Harkaway."

*The Best Hunter in any of the Five preceding Classes.**

TEASDALE HILTON HUTCHINSON: PLATE, value 25*l.*, for "The Jester."

Hackney Mares or Geldings, exceeding 15 *hands, and up to not less than* 12 *stone.*

MRS. HENRY FRISBY, 14, James Street, Buckingham Gate, London: FIRST PRIZE, 15*l.*, for "Eclat," chestnut mare, 5 years-old; breeder unknown; sire, "Pax;" dam, "Recluse."

MRS. LOUISA MALCOLM, Beechwood, Lyndhurst, Hampshire: SECOND PRIZE, 10*l.*, for "Homespun," brown mare, 4 years-old; bred by herself; sire, "Joskin;" dam, "Kef."

JOSEPH HENRY KNOWLES, 28, Dale End, Birmingham: THIRD PRIZE, 5*l.*, for "Romeo," bay gelding, 8 years-old; breeder unknown; sire, "Knight of Cards."

JOHN STOTT MILNE, Sale Lodge, Sale, Cheshire: the *Reserve Number*, to "Charles I.," dark chestnut gelding, 5 years-old; bred by Mr. Cook; sire, "Fireaway;" dam by "Sir Charles."

Hackney Mares or Geldings, exceeding 15 *hands, and up to not less than* 14 *stone.*

THOMAS STATTER, Stand Hall, Whitefield, Manchester: FIRST PRIZE, 15*l.*, for "Surprise," bay mare, 7 years-old; breeder unknown.

H.R.H. THE PRINCE OF WALES, K.G., Sandringham, King's Lynn: SECOND PRIZE, 10*l.*, for "Coomassie," brown gelding, aged; breeder unknown.

THOMAS COOK, Hull: THIRD PRIZE, 5*l.*, for "Rosalind," bay mare, 4 years-old; bred by Mr. Francis Cook, Riggs, Fridaythorpe, Yorkshire; sire, "Eclipse;" dam by "Fingal."

HENRY DEWES BEST, Bilston, Staffordshire: the *Reserve Number*, to "Domino," black-brown mare, 6 years-old; breeder unknown; sire, "Cæsar."

Weight-carrying Hacks or Roadsters, above 14 *hands and not exceeding* 15 *hands.**

WILLIAM EDWARD WILEY, Birches Green, Erdington, Birmingham: FIRST PRIZE, 15*l.*, for "Bob," bay gelding, 9 years-old; breeder unknown.

MISS ADELAIDE HARRISON, Eastland House, Leamington: SECOND PRIZE, 10*l.*, for "Major," bay gelding, aged; breeder unknown.

MANSFIELD HARRISON, Warter, Pocklington, Yorkshire: THIRD PRIZE, 5*l.*, for "Lady Jane Lindsay," brown mare, 4 years-old; bred by himself; sire, "Fireaway;" dam, "Fanny," by "Performer."

JOSEPH TYLER, 209, Broad Street, Birmingham: the *Reserve Number*, to his black gelding, 5 years-old; breeder unknown.

Park or Lady's Hacks, above 14 *hands and not exceeding* 15 *hands.**

ALFRED DARBY, Little Ness, Shrewsbury; FIRST PRIZE, 15*l.*, for "Prince," bay gelding, 10 years-old; bred by himself; sire, "Tingling Johnny;" dam, "Kitty."

FRANCIS COOK MATTHEWS, Easterfield House, Driffield, Yorkshire: SECOND PRIZE, 10*l.*, for "Ozone," brown mare, 8 years-old; bred by Mr. R. Fisher, Leckonfield House, Beverley; breeder unknown.

JAMES MOFFAT, Low Crosby-on-Eden, Carlisle: THIRD PRIZE, 5*l.*, for "Maggie," bay mare, 5 years-old; bred by himself; sire, "Laughing Stock."

STEPHEN KIRBY, 3, City Terrace, City Road, Manchester: the *Reserve Number*, to "Streamlet," bay mare, 9 years-old; bred by himself; sire, "Dr. Sangrado;" dam, "The Yore," by "Sweet Briar."

Pony Mares or Geldings, above 13 *hands and not exceeding* 14 *hands.*

THE DUKE OF HAMILTON, Easton Park, Wickham Market: FIRST PRIZE, 15*l.*, for "Bosco," black gelding, 6 years-old; breeder unknown; sire, "Performer."

WILLIAM READ COCKLE, Hill Row, Haddenham, Cambridgeshire: SECOND PRIZE, 10*l.*, for "Kingfisher," black gelding, 7 years-old; bred by himself; sire, "Clear the Way;" dam, "Butterfly."

FRANCIS FINCH BLADON, Rosemount Villa, Polsloe Road, Exeter: THIRD PRIZE, 5*l.*, for "Tally Ho," brown gelding, 5 years-old; breeder unknown; sire, "Harkaway."

THOMAS STATTER, Stand Hall, Whitefield, Manchester: the *Reserve Number*, to "Suspense," bay mare, 5 years-old; breeder unknown.

Pony Mares or Geldings, not exceeding 13 *hands.*

FRANCIS FINCH BLADON, Rosemount Villa, Polsloe Road, Exeter: FIRST PRIZE, 15*l.*, for "Taffy," grey gelding, 7 years-old; breeder unknown.

WILLIAM TYLER, 28, Frederick Street, Birmingham: SECOND PRIZE, 10*l.*, for "Billy," bay gelding, 12 years-old; breeder unknown.

E. M. E. WELBY, Norton Lees, Sheffield: THIRD PRIZE, 5*l.*, for "Timay," roan gelding, 8 years-old; breeder unknown.

WILLIAM M. HOBDAY, Monkspath Priory, Shirley, Birmingham: "Little Bob" awarded SECOND PRIZE, but disqualified on account of being over the height.

Harness Mares or Geldings, over 15 *hands.**

THOMAS STATTER, Stand Hall, Whitefield, Manchester: FIRST PRIZE, 20*l.*, for "Speculation," chestnut mare, 6 years-old; breeder unknown.

Howard Mapplebeck, Bradford Street, Birmingham: Second Prize, 10*l.*, for "Polly," grey mare, aged; bred by Sir Charles Mordaunt.

Harness Mares or Geldings, over 14 *hands and not exceeding* 15 *hands.**

Miss Adelaide Harrison, Eastland House, Leamington: First Prize, 20*l.*, for "Minor," bay mare, 7 years-old; breeder unknown.

Albert Charles Jones, Hallfield House, Edgbaston, Birmingham: Second Prize, 10*l.*, for "Kitty," bay mare, about 7 years-old; breeder unknown.

George David Badham, The Lawn, Bulmer, Sudbury: Third Prize, 5*l.*, for "Zoe," brown mare, 7 years-old; bred by Mr. George Cook, Smeatham Hall, Sudbury: sire, "Morgan Lightfoot."

John Henry Daglish, 132, Great Homer Street, Liverpool: the *Reserve Number*, to "Dolly Varden," chestnut mare, 5 years-old; breeder unknown.

Harness Ponies, over 13 *hands and not exceeding* 14 *hands.**

Mrs. Henry Frisby, 14, James Street, Buckingham Gate, London: First Prize, 15*l.*, for "King Polo," chestnut gelding, 6 years-old; breeder unknown; sire, "Apricot."

Tom Mitchell, Bowling Park, Bradford, Yorkshire: Second Prize, 10*l.*, for "Lady Isabel," bay mare, 5 years-old; bred by Mr. Backhouse, Wistow, Selby; sire, "A la Mode;" dam, "Jenny," by "Serenader."

William Chambers, Windsor Terrace, Hockley, Birmingham: Third Prize, 5*l.*, for "Emperor," dark bay gelding, 6 years-old; breeder unknown.

James Nock Clarke, Harborne, Staffordshire: the *Reserve Number*, to "Kitty," grey mare, 14 years-old; bred by the late Rev. F. J. Clarke, Broad Hidley Hall, Quinton, Worcestershire.

Harness Ponies not exceeding 13 *hands.**

Joseph Allkins, 96, Summer Lane, Birmingham: First Prize, 15*l.*, for "Belle of the Ball," bright brown mare, 9 years-old; breeder unknown.

William Chambers, Windsor Terrace, Hockley, Birmingham: Second Prize, 10*l.*, for "Prince," bay gelding, 6 years-old; breeder unknown.

John Rolt, Ozleworth Park, Wotton-under-Edge, Gloucestershire: the *Reserve Number*, to "Puzzle Monkey," black gelding, about 5 years-old; breeder unknown.

CATTLE.

Shorthorns—Bulls above Three Years old.

The Marquis of Exeter. Burghley Park, Stamford: First Prize, 30*l.*, for "Telemachus 6th" (35,725), roan, 3 years, 6 months, 2 weeks, 2 days-old; bred by himself; sire, "Telemachus" (27,603); dam, "Sea Gull," by "Nestor" (24,648); g. d., "Petrel," by "4th Duke of Thorndale" (17,750); gr. g. d., "Sandpiper," by "The Briar" (15,376).

William Linton, Sheriff Hutton, York: Second Prize, 20*l.*, for "Sir Arthur

Ingram" (32,490), roan, 4 years, 5 months, 6 days-old; bred by himself; sire "Serjeant-Major" (29,957); dam, "Fragrance," by "Mountain Chief" (20,383); g. d., "Miss Topsy," by "Blood Royal" (17,423); gr. g. d., "Yorkshire Lass," by "Magnus Troil" (14,880).

THE EARL OF SHREWSBURY, Ingestre Hall, Stafford, THIRD PRIZE, 15*l.*, for "Hindoo Chief," roan, 4 years, 3 months, 2 days-old; bred by Mr. Heskett, Plumpton Hall, Penrith; sire, "Indian Chief" (26,434); dam, "Hazeltop 26th," by "Wild Boy" (25,447); g. d., "Hazeltop 9th," by "Nunwick" (16,635); gr. g. d., "Hazeltop 5th," by "Sir Charles" (12,075).

THOMAS ATKINSON, Higher House, Unsworth, Manchester: FOURTH PRIZE, 10*l.*, for "Sergeant Irwin," red and white, 3 years, 3 months, 2 weeks, 4 days-old; bred by Mr. W. Linton, Sheriff Hutton, York; sire, "Serjeant-Major" (29,957); dam, "Home Beauty," by "Mountain Chief" (20,383); g. d., "Handmaid," by "Magnus Troil" (14,880); gr. g. d., "White Rose," by "Magnus Troil" (14,880).

WILLIAM AND HENRY DUDDING, Panton House, Wragby, Lincolnshire: the *Reserve Number*, to "Robert Stephenson" (32,313); roan, 4 years, 8 months-old; bred by the late Mr. Torr, Aylesby Manor, Grimsby: sire, "Royal Prince" (27,384); dam, "Riby Peeress," by "Breastplate."

Shorthorns—Bulls above Two and not exceeding Three Years old.

ALEXANDER HENRY BROWNE, Doxford, Chathill, Northumberland: FIRST PRIZE, 25*l.*, for "Pioneer" (35,042), white, 2 years, 3 months, 3 weeks, 3 days-old; bred by himself; sire, "Duke of Aosta" (28,356); dam, "Prunette," by "Lord Plymouth" (24,455); g. d., "Prunella," by "Knight Errant" (18,154); gr. g. d., "Prude," by "Valasco" (15,443).

THE MARQUIS OF EXETER, Burghley Park, Stamford: SECOND PRIZE, 15*l.*, for "Telemachus 9th" (35,727), roan, 2 years, 6 months, 3 weeks 6 days-old; bred by himself; sire, "Telemachus" (27,603); dam, "Sea Gull," by "Nestor" (24,648); g. d., "Petrel," by "4th Duke of Thorndale" (17,750); gr. g. d., "Sandpiper," by "The Briar" (15,376).

FRANCIS J. SAVILE FOLJAMBE, M.P., Osberton Hall, Worksop, Notts: THIRD PRIZE, 10*l.*, for "Sweet Pea," roan, 2 years, 8 months, 3 days-old; bred by himself; sire, "M.P." (29,398); dam, "Sweetheart 28th," by "Count Leinster" (23,638); g. d., "Sweetheart 11th," by "The Baron" (13,833); gr. g. d., "Sweetheart 3rd," by "Daybreak" (11,338).

JAMES SLEE BULT, Dodhill House, Taunton: FOURTH PRIZE, 5*l.*, for "Gallant Gay" (33,983), roan, 2 years, 3 months, 2 weeks, 5 days-old; bred by Mr. R. Jefferson, Preston Hows, Whitehaven; sire, "Gay Cavalier" (31,223); dam, "Bona Dea," by "Knight of the Shire" (26,552); g. d., "Bonne Fille 2nd," by "Duke of Cumberland" (21,584); gr. g. d., "Bonne Fille," by "Sir Roger" (16,991).

WILLIAM HERBERT WODEHOUSE, Woolmers Park, Hertford: the *Reserve Number*, to "Royal Havering 2nd," roan, 2 years, 3 months, 1 week, 6 days-old; bred by Mr. D. McIntosh, Havering Park, Romford; sire, "3rd Duke of Geneva" (23,753); dam, "Dewdrop," by "Prince of Saxe Coburg" (20,576); g. d., "Duchess," by "Duke of Cambridge" (12,742); gr. g. d., "Cold Cream," by "Earl of Dublin" (10,178).

Shorthorns—Yearling Bulls above One and not exceeding Two Years old.

THOMAS HARDWICK BLAND, Dingley Grange, Market Harborough, Leicestershire: FIRST PRIZE, 25*l.*, for "General Fusee," roan, 1 year, 11 months, 5 days-old; bred by himself; sire, "Earl of Waterloo 2nd" (33,819); dam, "Fairy," by "African;" g. d., "Beauty," by "Harry;" gr. g. d., "Miss Pittam 2nd," by "Castle Ashby."

THE DUKE OF NORTHUMBERLAND, Alnwick Castle: SECOND PRIZE, 15*l.*, for "Snowstorm," white, 1 year, 8 months, 2 weeks, 6 days-old; bred by himself; sire, "Mayor of Windsor" (31,897); dam, "Snowdrop," by "Ace of Trumps" (30,355); g. d., "Woodbine," by "Vice-President" (23,125); gr. g. d., "Rosebud," by "Majestic" (13,279).

BENJAMIN ST. JOHN ACKERS, Prinknash Park, Painswick: THIRD PRIZE, 10*l.*, for "Clovis," roan, 1 year, 10 months, 3 weeks, 6 days-old; bred by himself; sire, "County Member" (28,268), dam, "Clotilde 3rd," by "Lord Plymouth" (24,455); g. d., "Clotilde," by "Knight Errant" (18,154); gr. g. d., "Chloe," by "Cardigan" (12,556).

JOHN ROWLEY, jun., Stubbs Walden, Pontefract, Yorkshire: FOURTH PRIZE, 5*l.*, for "Count Towneley," light roan, 1 year, 10 months, 1 week, 5 days-old; bred by Mr. J. Snarry, Marramatts, Sledmere, York; sire, "Earl Lyon" (33,779); dam, "Princess 3rd," by "Duke of Towneley" (21,615); g. d., "Red Princess," by "Gipsy Prince" (17,765); gr. g. d., "Brady," by "Codrington" (14,290).

JOHN WRIGHT, jun., Green Gill Head, Penrith: the *Reserve Number*, to "Beacon" (33,125), roan, 1 year, 9 months, 1 week, 1 day-old; bred by himself; sire, "Man's Estate" (26,806); dam, "Genevieve," by "Royal Cambridge Gwynne" (29,849); g. d., "Godiva," by "Polites" (22,534); gr. g. d., "Leona," by "Hogarth" (13,036).

Shorthorns—Bull Calves above Six and not exceeding Twelve Months old.

JOHN TORR, M.P., Aylesby Manor, Grimsby, Lincolnshire: FIRST PRIZE, 15*l.*, for "FitzWilliam," white, 11 months, 4 weeks, 1 day-old; bred by himself; sire, "Knight of the Shire" (26,552); dam, "Heather Flower," by "Lord Napier" (26,688); g. d., "Highland Flower," by "Mountain Chief" (20,383); gr. g. d., "Clarence Flower," by "FitzClarence" (14,552).

WILLIAM NEVETT, Yorton Villa, Harmer Hill, Shropshire: SECOND PRIZE, 10*l.*, for "Claro's Duke," roan, 11 months, 4 weeks, 1 day-old; bred by himself; sire, "Lord Claro 2nd" (31,640); dam, "Venus," by "Nil Desperandum" (26,963); g. d., "Verandah," by "Royal Councillor" (20,725); gr. g. d., "Marquee," by "Archduke 2nd" (15,588).

THE DUKE OF NORTHUMBERLAND, Alnwick Castle: THIRD PRIZE, 5*l.*, for "Cheveley," white, 9 months, 5 days-old; bred by himself: sire, "Duke of Tyne" (33,744); dam, "Vilage Maid," by "Jeweller" (26,460); g. d., "Harriet," by "Vice President" (23,125); gr. g. d., "Buttercup," by "George 3rd" (16,147).

BENJAMIN ST. JOHN ACKERS, Prinknash Park, Painswick, Gloucestershire: the *Reserve Number*, to "Prince of Georgia," roan, 9 months, 3 weeks-old; bred by himself; sire, "County Member" (28,268); dam, "Georgie's Queen," by "Brigade Major" (21,312); g. d., "Georgie," by "Prince George" (13,510); gr. g. d., "Hopeful," by "Hopewell" (10,332).

Shorthorns—Cows above Three Years old.

THE REV. ROBERT BRUCE KENNARD, Marnhull, Blandford: FIRST PRIZE, 20*l.*, for "Queen Mary," roan, 3 years, 11 months, 3 weeks-old, in-calf; bred by himself; sire, "Grand Duke of Oxford" (28,763); dam, "Queen

Anne," by "Lord Stanley 2nd" (26,745); g. d., "Queen Bertha," by "Maccaroni" (24,498); gr. g. d., "Mildred," by "Duke of Norfolk" (17,735).

Teasdale Hilton Hutchinson, Manor House, Catterick, Yorkshire: Second Prize, 10*l.*, for "Lady Alicia," roan, 3 years, 5 months, 3 weeks, 5 days-old, in-milk and in-calf; bred by himself; sire, "King James" (28,971); dam, "Lady Alberta," by "Lord Albert" (20,143); g. d., "Lady of the Manor," by "Baron Warlaby" (7813); gr. g. d., "Lady Barton," by "Vesuvius" (5559). Calved September 30, 1875.

William and Henry Dudding, Panton House, Wragby, Lincolnshire: Third Prize, 5*l.*, for "Blooming Bride," red, 4 years, 10 months, 1 week, 4 days-old, in-milk; bred by themselves; sire, "Robin" (24,968); dam, "Bloomer," by "Lord Panton" (22,204); g. d., "Birthright," by "Royal Favour" (15,200); gr. g. d., "Daisy," by "Sylvan" (10,907). Calved June 15, 1876.

Ambrose Robotham, Oak Farm, Drayton Bassett, Tamworth: the *Reserve Number*, to "Eleanor," roan, 10 years, 4 months, 3 weeks, 2 days-old, in-milk and in-calf; bred by Mr. T. Harris, Stoney Lane, Bromsgrove; sire, "Castlereagh" (19,409); dam, "Edith," by "Baron Berrington" (17,357); g. d., "Clematis," by "Duke William" (11,400); gr. g. d., "Cowslip," by "Cramer 2nd" (10,084). Calved January 14, 1876.

Shorthorns—Heifers in-milk or in-calf, not exceeding Three Years old.

The Rev. Robert Bruce Kennard, Marnhull, Blandford: First Prize, 20*l.*, for "Blossom Second," roan, 2 years, 6 months, 1 week, 6 days-old, in-calf; bred by himself; sire, "Grand Duke of Oxford" (28,763); dam, "Blossom," by "Earl of Darlington" (21,636); g. d., "Belinda," by "Sir Roger" (16,991); gr. g. d., "Berrington Lass," by "Sir Walter" (10,834): and Second Prize, 15*l.*, for "Olga," white, 2 years, 11 months, 1 week-old; in-calf; bred by himself; sire, "Grand Duke of Oxford" (28,763); dam, "Juliet," by "Wonder" (21,126); g. d., "Ethelinda," by "Marmaduke" (14,897); gr. g. d., "Electra," by "Lovemore" (10,476).

Emily, Lady Pigot, West Hall, Weybridge Station, Surrey: Third Prize, 10*l.*, for "Flatterer," red and white, 2 years, 5 months, 2 weeks, 4 days-old, in-calf; bred by herself; sire, "Victor Rex" (30,227); dam, "Flossy," by "Royal Arthur" (29,840); g. d., "Lady Flora," by "Protector" (20,609); gr. g. d., "Cleasby Daisy," by "King Consort" (16,335).

John Lamb, Burrell Green, Penrith: Fourth Prize, 5*l.*, for "Laurestina 3rd," red and white, 2 years, 6 months, 4 weeks, 1 day-old, in-calf; bred by himself; sire, "Hubback Junior" (31,395); dam, "Laurestina," by "Edgar" (19,680); g. d., "Laurel," by "Nunwick" (16,635); gr. g. d., "Lilac," by "Sulyman" (12,157).

Sir William G. Armstrong, C.B., Cragside, Morpeth, Northumberland: the *Reserve Number*, to "3rd Oxford's Welfare," roan, 2 years, 3 months, 2 weeks, 6 days-old, in-calf; bred by himself; sire, "Oxford le Grand" (29,496); dam, "Wharfdale's Welfare," by "Third Lord Wharfdale" (26,759); g. d., "Oxford's Welfare," by "Earl of Oxford" (15,966); gr. g. d., "Blanche," by "Hugh Miller" (18,080).

Shorthorns—Yearling Heifers, above One and not exceeding Two Years old.

Emily, Lady Pigot, West Hall, Weybridge Station, Surrey: First Prize, 20*l.*, for "Imperious Queen," light roan, 1 year, 10 months, 3 weeks, 3 days-old; bred by herself; sire, "Victor Rex" (30,227); dam, "Imperial Rose 2nd," by "Prince of the Empire" (20,578); g. d., "Imperial Rose," by "Prince Imperial" (15,095); gr. g. d., "Red Rose," by "Vanguard" (10,994).

David McIntosh, Havering Park, Romford, Essex: Second Prize, 15*l.*, for "Charmer 24th," red, 1 year, 9 months, 1 week, 2 days-old; bred by himself; sire, "Duke of Hainault" (33,661); dam, "Charmer 18th," by "3rd Duke of Geneva" (23,753); g. d., "Science," by "Chanter" (19,423); gr. g. d., "Sweetheart 2nd," by "Earl of Dublin" (10,178).

The Rev. Robert Bruce Kennard, Marnhull, Blandford: Third Prize, 10*l.*, for "Iole," roan, 1 year, 9 months, 4 weeks, 1 day-old; bred by himself; sire, "Grand Duke of Oxford" (28,763); dam, "Juliet," by "Wonder" (21,126); g. d., "Ethelinda," by "Marmaduke" (14,897); gr. g. d., "Electra," by "Lovemore" (10,476).

Clement Whitehead Griffin, Werrington, Peterborough: Fourth Prize, 5*l.*, for "Blushing Rose," roan, 1 year, 7 months, 1 week, 6 days-old; bred by himself; sire, "Telemachus 2nd" (32,649); dam, "Blush 3rd," by "Liberator" (24,331); g. d., "Blush," by "Caxton" (21,433); gr. g. d., "Bride," by "Gameboy" (14,585).

The Mytton Farming Company (Limited), Mytton, Whalley, Lancashire: the *Reserve Number*, to "Ruby 6th," roan, 1 year, 9 months, 2 weeks, 5 days-old; bred by Mr. J. P. Haslam, Gilnow, Bolton-le-Moors; sire, "Sidus" (29,969); dam, "Ruby 4th," by "Abbot of Knowlmere" (19,183); g. d., "Ruby 3rd," by "Red Duke" (18,676); gr. g. d., "Ruby 2nd," by "Constitution"(14,320).

Shorthorns—Heifer Calves, above Six and under Twelve Months old.

Charles Augustus Barnes, Solesbridge, Rickmansworth, Herts: First Prize, 15*l.*, for "Golden Duchess 4th," red and white, 10 months, 2 weeks, 6 days-old; bred by Mr. E. J. Coleman, Stoke Park, Slough; sire, "Third Duke of Glo'ster" (33,653); dam, "Golden Duchess 2nd," by "Barrington Oxford" (25,607); g. d., "Golden Duchess," by "Golden Duke" (19,860); gr. g. d., "Czarina," by "Second Grand Duke" (12,961).

Emily, Lady Pigot, West Hall, Weybridge Station, Surrey: Second Prize, 10*l.*, for "Dainty Dame," 10 months, 4 weeks, 1 day-old; bred by herself; sire, "Opoponax" (34,950); dam, "Dame Dorcas," by "Valorous" (27,701); g. d., "Dame Patience," by "Prince of the Realm" (22,627); gr. g. d., "Dame Quickly," by "Valasco" (15,443).

The Earl of Dunmore, Dunmore, Stirling, N.B.: Third Prize, 5*l.*, for "Red Rose of Strathearne," red and white, 11 months, 3 weeks, 4 days-old; bred by himself; sire, "Sixth Duke of Geneva" (30,959); dam, "Red Rose of Strathtay," by "Joe Johnson" (3144); g. d., "Duchess 4th," by "Airdrie" (30,365); gr. g. d., "Duchess 2nd," by "Pilot" (32,066).

William Hosken and Son, Loggan's Mill, Hayle, Cornwall: the *Reserve Number*, to "Miss Ada 8th Twin," roan, 9 months, 1 week, 5 days-old; bred by themselves; sire, "Second Baron Wild Eyes" (30,497); dam, "Miss Ada 3rd," by "Second Earl of Oxford" (23,844); g. d., "Miss Ada," by "Royal Oak" (22,793); gr. g. d., "Duchess," by "Count Cavour" (19,523).

Herefords—Bulls above Three Years old.

William Taylor, Showle Court, Ledbury, Herefordshire: First Prize, 25*l*., for "Tredegar" (5077), 3 years, 6 months, 4 weeks-old; bred by himself; sire, "Mercury" (3967); dam, "Beauty," by "Holmer" (2043).

Warren Evans, Llandowlais, Usk, Monmouthshire: Second Prize, 15*l*., for "Von Moltke 2nd," 4 years, 4 months, 1 week, 5 days-old; bred by himself; sire, "Von Moltke" (4234); dam, "Countess 3rd," by "Monaughty" (2117).

Thomas Middleton, Llynaven, Clun, Salop: Third Prize, 5*l*., for "Baron 4th," 3 years, 4 weeks, 1 day-old; bred by the Rev. A. Clive, Whitfield, Hereford; sire, "Baronet" (3671); dam, "Silver," by "Chieftain 4th."

John Richards, Green Hall, Llanfyllin, Montgomeryshire: the *Reserve Number*, to "Gilder" (3836), 5 years, 3 months, 2 weeks, 5 days-old; bred by Mr. T. L. Meire, Eyton-on-Severn, Shrewsbury; sire, "Silver Boy" (3419); dam, "28," by "Gleam" (2548).

Herefords—Bulls above Two and not exceeding Three Years old.

Thomas Thomas, St. Hilary, Cowbridge, Glamorganshire: First Prize, 25*l*., for "Horace 2nd" 2 years, 1 month, 3 weeks, 3 days-old; bred by Mr. J. Price, Court House, Pembridge; sire, "Horace" (3877); dam, "Damsel 2nd," by "Wanderer" (5132).

William Clement Davy, Horn Park, Beaminster, Dorset: Second Prize, 15*l*., for "Lord Compton," 2 years, 10 months, 3 weeks, 3 days-old; bred by Mr. W. B. Peren, Compton House, South Petherton; sire, "Lord Lincoln" (3220); dam, "Ivington Rose," by "Sir Thomas" (2228).

Tom Llewelyn Brewer, Dan-y-graig, Newport, Monmouthshire: the *Reserve Number*, to "Alphonso" (4305), 2 years, 4 months, 3 weeks-old; bred by Mr. R. Keene, Pen Craig, Caerleon; sire, "Tredegar" (4210); dam, "Bonny 7th," by "Monaughty 3rd" (3262).

Herefords—Yearling Bulls above One and not exceeding Three Years old.

William Taylor, Showle Court, Ledbury: First Prize, 25*l*., for "Thoughtful" (5063), 1 year, 9 months, 4 days-old; bred by himself; sire, "Mercury" (3967); dam, "Young Beauty."

Sarah Edwards, Wintercote, Leominster, Herefordshire: Second Prize, 15*l*., for "Sir Edward," 1 year, 9 months, 3 weeks, 6 days-old; bred by herself; sire, "Winter de Cote" (4253); dam, "Young Meremaid 3rd," by "Leominster 3rd" (3211).

William Taylor, Showle Court: Third Prize, 5*l*., for "Taunton" (5035), 1 year, 11 months, 1 week, 6 days-old; bred by himself; sire, "Triumph 2nd" (3553); dam, "Hazel," by "Tom Brown" (2828).

Charles Henry Hinckesman, Charlcotte, Bridgnorth, Salop: the *Reserve Number*, to "Sir Wilfrid 2nd," 1 year, 9 months, 4 weeks-old; bred by himself; sire, "Sir Wilfrid" (5000); dam, "Jessica 2nd," by "Agriculturist" (1842).

Herefords—Bull Calves above Six and not exceeding Twelve Months old.

William Taylor, Showle Court: First Prize, 10*l*., for "Telescope," 11 months, 1 week-old; bred by himself; sire, "Tredegar" (5077); dam, "Tulip," by "Triumph" (2836).

THOMAS JAMES CARWARDINE, Stockton, Bury, Leominster: SECOND PRIZE, 5*l.*, for "Ben Battle," 9 months, 1 day-old; bred by himself; sire, "Longhorns" (4711); dam, "Florence" by "De Cote" (3060).

HENRY NICHOLAS EDWARDS, Broadward, Leominster: the *Reserve Number*, to "Durable," 11 months, 3 days-old; bred by himself; sire, "Arkwright 2nd" (4315); dam, "Dahlia 4th," by "Philip" (3314).

Herefords—Cows above Three Years old.

WILLIAM TUDGE, Adforton, Leintwardine, Herefordshire: FIRST PRIZE, 20*l.*, for "Rosebud," 8 years-old, in-milk; bred by Mr. B. Rogers, The Grove, Pembridge; sire, "Sir Thomas" (2228); dam, "Rose," by "North Star" (2138). Calved March 20, 1876.

THOMAS THOMAS, St. Hilary, Cowbridge, Glamorganshire: SECOND PRIZE, 10*l.*, for "Rosaline," 5 years, 11 months, 1 week, 3 days-old, in-milk and in-calf; bred by himself; sire, "Sir John 3rd" (3456); dam, "Fairy," by "Shamrock" (2750).

WILLIAM TAYLOR, Showle Court, Ledbury, Herefordshire: THIRD PRIZE, 5*l.*, for "Hazel 3rd," 8 years, 10 months-old, in-calf; bred by himself; sire, "Triumph" (2836); dam, "Hazel," by "Tom Brown" (2828).

THE REV. ARCHER CLIVE, Whitfield, Hereford: the *Reserve Number*, to "Satin," 3 years, 4 months, 4 weeks-old; bred by himself; sire, "Baronet" (3671); dam, "Spot," by "Plato" (2160). Calved February, 1876.

Herefords—Heifers, in-milk or in-calf, not exceeding Three Years old.

THOMAS JAMES CARWARDINE, Stockton Bury, Leominster: FIRST PRIZE, 15*l.*, for "Helena," 2 years, 11 months, 3 weeks, 4 days-old, in-calf; bred by himself; sire, "De Cote" (3060); dam, "Regina," by "Heart of Oak" (2035).

WARREN EVANS, Llandowlais, Usk, Monmouthshire: SECOND PRIZE, 10*l.*, for "Lady Blanche," 2 years, 5 months, 1 week, 4 days-old, in-calf: bred by himself; sire, "Von Moltke 2nd" (5127); dam, "Fairmaid," by "Prince Alfred" (3342).

HER MAJESTY THE QUEEN, Windsor Castle; THIRD PRIZE, 5*l.*, for "Duchess of Edinburgh," 2 years, 10 months, 2 weeks-old, in-calf; bred by Her Majesty, Flemish Farm, Windsor; sire, "Prince Leopold;" dam, "Adelaide 2nd," by "Prince Leopold": and the *Reserve Number*, to "Princess Elizabeth," 2 years, 11 months, 1 week, 4 days-old, in-calf; bred by Her Majesty, Flemish Farm, Windsor; sire, "Prince Leopold;" dam, "Victoria the Second," by "Ajax."

Herefords—Yearling Heifers above One and not exceeding Two Years old.

MRS. EDWARDS, Wintercott, Leominster, Herefordshire: FIRST PRIZE, 15*l.*, for "Mabel," 1 year, 11 months, 3 weeks, 5 days-old; bred by herself; sire, "Winter de Cote" (4253); dam, "Myrtle 3rd," by "Tomboy" (3546).

WILLIAM BURCHALL PEREN, Compton House, South Petherton, Somerset: SECOND PRIZE, 10*l.*, for "Lady Lottie," 1 year, 11 months, 3 weeks, 1 day-old; bred by himself; sire, "Lord Lincoln" (3220); dam, "Lady Evie," by "Plutarch" (3332).

PHILIP TURNER, The Leen, Pembridge, Herefordshire: THIRD PRIZE, 5*l.*, for

"Mulberry," 1 year, 10 months, 4 weeks, 1 day-old; bred by himself; sire, "Silver Boy" (3419); dam, "Maud," by "Jupiter" (3191).

WILLIAM TAYLOR, Showle Court, Ledbury, Herefordshire: the *Reserve Number* to "Duchess 3rd," 1 year, 11 months, 5 days-old; bred by himself; sire, "Mercury" (3967); dam, "Duchess," by "Twin" (2284).

Herefords—Heifer Calves above Six and under Twelve Months old.

MRS. EDWARDS, Wintercott, Leominster: FIRST PRIZE, 15*l.*, for "Beatrice," 10 months, 1 week, 2 days-old; bred by herself; sire, "Winter de Cote" (4253); dam, "Brownmaid 2nd," by "Tomboy" (3546): and SECOND PRIZE, 10*l.*, for "Leonora," 10 months, 2 weeks, 6 days-old; bred by herself; sire, "Winter de Cote" (4253); dam, "Lovely," by "Tomboy" (3546).

WILLIAM HARRIS, Llansoar Vaur, Caerleon, Monmouthshire: the *Reserve Number*, to "Rosa," 7 months, 1 week, 3 days-old; bred by himself; sire, "Prince Arthur;" dam, "Blossom."

Devons—Bulls above Three Years old.

WALTER FARTHING, Stowey Court, Bridgwater: FIRST PRIZE, 25*l.*, for "Master Robin," 4 years, 11 months, 4 weeks-old; bred by himself; sire, "Master Arthur;" dam, "Verbena," by son of "Duke of Somerset."

JOHN GOULD, Bampfylde Lodge, Exeter: SECOND PRIZE, 15*l.*, for "Tempter," 4 years, 3 months-old; bred by the late Mr. J. Davy, Flitton Barton; sire, "Duke of Flitton 4th;" dam, "Temptress 2nd," by "Duke of Cornwall."

VISCOUNT FALMOUTH, Tregothnan, Probus, Cornwall: THIRD PRIZE, 5*l.*, for "Kingcraft" (1132), 6 years, 11 months, 2 weeks-old; bred by himself; sire, "Sunflower" (937); dam, "Peach" (2095A).

MAJOR R. H. BULLER, C.B., Downes, Crediton, Devon: the *Reserve Number*, to his 3 years, 3 months-old; bred by the late Mr. J. H. Buller, Downes.

Devons—Bulls above Two and not exceeding Three Years old.

VISCOUNT FALMOUTH, Tregothnan, Probus, Cornwall: FIRST PRIZE, 25*l.*, for "Duke of Tregothnan," 2 years, 11 months, 1 week-old; bred by himself; sire, "Arthur" (997); dam, "Rosa Bonheur" (3009): and SECOND PRIZE, 15*l.*, for "The only Jones," 2 years, 8 months, 1 week, 6 days-old; bred by himself; sire, "Arthur" (997); dam, "Photograph" (3758).

WALTER FARTHING, Stowey Court, Bridgwater: THIRD PRIZE, 5*l.*, for "Jack," 2 years, 4 months, 3 weeks-old; bred by himself; sire, "Master Robin;" dam, "Milkmaid," by "Master Ellic."

MRS. LANGDON, Flitton Barton, North Molton, Devon: the *Reserve Number*, to "Duke of Flitton 12th," 2 years, 2 months, 3 weeks, 2 days-old; bred by herself; sire, "Duke of Flitton 10th" (1074); dam, "Temptress 2nd" (3070), by "Duke of Cornwall" (820).

Devons—Yearling Bulls above One and not exceeding Two Years old.

WALTER FARTHING, Stowey Court, Bridgwater: FIRST PRIZE, 25*l.*, for "Master James," 1 year, 10 months, 6 days-old; bred by himself; sire, "Master Robin;" dam, "Cherry 3rd," by "Duke of Flitton 2nd."

VISCOUNT FALMOUTH, Tregothnan: SECOND PRIZE, 15*l.*, for "Sirloin," 1 year, 8 months, 3 weeks, 2 days-old; bred by himself; sire, "Lord of the Valley" (1150); dam, "Peach" (2095A).

VISCOUNT FALMOUTH, Tregothnan: the *Reserve Number*, to "Romany Rye," 1 year, 10 months, 1 week, 1 day-old; bred by himself; sire, "Lord of the Valley" (1150); dam, "Cinnaminta" (2572B).

Devons—Bull Calves above Six and not exceeding Twelve Months-old.

WALTER FARTHING, Stowey Court: FIRST PRIZE, 10*l.*, for his 8 months, 3 weeks, 6 days-old; bred by himself; sire, "Master Robin;" dam, "Prettyface," by "Lovely's Duke": and SECOND PRIZE, 5*l.*, for his 11 months, 1 day-old; bred by himself; sire, "Master Willie;" dam, "Old Verbena's Sister," by "Duke."

HER MAJESTY THE QUEEN, Windsor Castle: the *Reserve Number*, to "Prince Albert Victor," 11 months, 5 days-old; bred by Her Majesty, Norfolk Farm, Windsor; sire, "Napier;" dam, "Rosebud," by "Prince Imperial."

Devons—Cows above Three Years-old.

WALTER FARTHING, Stowey Court, Bridgwater: FIRST PRIZE, 20*l.*, for "Prettyface," 3 years, 6 months, 1 week, 3 days-old, in-milk and in-calf; bred by himself; sire, "Lovely's Duke; dam, "Prettyface," by "Sir George." Calved October 4, 1875.

MRS. LANGDON, Flitton Barton, North Molton, Devon: SECOND PRIZE, 10*l.*, for "Actress 2nd" (2478), 9 years, 7 months, 1 week, 4 days-old, in-milk and in-calf; bred by the late Mr. Davy, Flitton Barton, North Molton; sire, "Duke of Flitton 3rd" (826); dam, "Actress" (1749), by "Palmerston" (476). Calved October, 1875.

WILLIAM PERRY, Alder, Lewdown, Devon: THIRD PRIZE, 5*l.*, for "Dairymaid," about 7 years, 5 months-old, in-milk; bred by Mr. J. Quartly, Champson, South Molton; sire, "Baronet" (781); dam, "Dairymaid" (1900). Calved April 5, 1876.

TREVOR LEE SENIOR, Broughton House, Aylesbury, Bucks: the *Reserve Number*, to "Moss Rose 1st," 3 years, 11 months, 3 weeks-old, in-calf; bred by himself; sire, "Stowey;" dam, "Moss Rose" (3716), by "Island Prince" (862).

Devons—Heifers in-milk or in-calf, not exceeding Three Years-old.

MRS. LANGDON, Flitton Barton, North Molton, Devon: FIRST PRIZE, 15*l.*, for "Actress 8th" (3149), 2 years, 10 months, 2 weeks, 6 days-old, in-calf; bred by herself; sire, "Duke of Flitton 8th" (1072); dam, "Actress 5th" (3146), by "Duke of Flitton 4th" (827).

HER MAJESTY THE QUEEN, Windsor Castle: SECOND PRIZE, 10*l.*, for "Florence," 2 years, 10 months, 5 days-old, in-calf; bred by Her Majesty, Norfolk Farm, Windsor; sire, "Napier;" dam, "Lavender," by "Clarendon": and THIRD PRIZE, 5*l.*, for "Alice," 2 years, 10 months, 4 days-old, in-calf; bred by Her Majesty, Norfolk Farm, Windsor; sire, "Prince Imperial;" dam, "Oliver 2nd," by "Duke."

Devons—Yearling Heifers, above One and not exceeding Two Years old.

WALTER FARTHING, Stowey Court, Bridgwater: FIRST PRIZE, 15*l.*, for his 1 year, 9 months, 2 days-old; bred by himself; sire, "Forester;" dam, "Nellie," by "Duke."

GEORGE TURNER, Brampford Speke, Exeter: SECOND PRIZE, 10*l.*, for "Royal Duchess," 1 year, 11 months, 3 days-old; bred by himself; sire, "Duke of Devon;" dam, "Lady Evlyn," by "Albert Victor."

MAJOR R. H. BULLER, C.B., Downes, Crediton, Devon: THIRD PRIZE, 5*l.*, for his 1 year, 11 months-old; bred by the late Mr. J. H. Buller, Downes.

TREVOR LEE SENIOR, Broughton House, Aylesbury, Bucks: the *Reserve Number*, to "Picotee 1st," 1 year, 9 months, 3 weeks-old; bred by himself; sire, "Major" (1155); dam, "Pink," by "Prince of Wales."

Devons—Heifer-Calves above Six and under Twelve Months-old.

WALTER FARTHING, Stowey Court: FIRST PRIZE, 10*l.*, for his 9 months, 6 days-old; bred by himself; sire, "Master Willie;" dam, "Famous."

VISCOUNT PORTMAN, Bryanston, Blandford, Dorset: SECOND PRIZE, 5*l.*, for "Ladybird," 8 months, 2 weeks, 6 days-old; bred by himself; sire, "Duke of Plymouth" (1080); dam, "Lemon," by "Prince Albert" (907).

MRS. LANGDON, Flitton Barton, North Molton: the *Reserve Number*, to "Temptress 6th," 10 months, 2 weeks, 5 days-old; bred by herself; sire, "Young Palmerston" (1251); dam, "Temptress 3rd" (3961), by "Duke of Flitton 4th" (827).

Jerseys—Bulls above Two Years old.

COLONEL WILLIAM BARROWS, The Birches, Hagley, Worcestershire: FIRST PRIZE, 15*l.*, for "Madman," dappled fawn, 2 years, 3 weeks, 6 days-old; bred by himself; sire, "Rosslyn;" dam, "Madcap," by "Young Duke."

THOMAS HEPBURN, Clapham Common, Surrey: SECOND PRIZE, 10*l.*, for "Silver Prince," silver grey, 4 years, 5 months-old; bred by Mr. E. Birkbeck, Horsted Hall, Norfolk; sire, "Sultan;" dam, "Myrtle," by "Collie."

HERBERT ADDINGTON RIGG, Wykeham Lodge, Walton-on-Thames, Surrey; THIRD PRIZE, 5*l.*, for "Steel," dark fawn, 2 years, 3 months, 3 weeks, 5 days-old; bred by Mr. H. Drewitt, Milville, Titchfield; sire, "Storm Cloud;" dam, "Jess."

GEORGE DIGBY WINGFIELD DIGBY, Sherborne Castle, Dorset: the *Reserve Number* to "Prince Charlie," silver grey, 2 years, 1 month, 2 weeks-old; bred by Mr. W. Amy, St. Peter's, Jersey; sire, "Young Yankee;" dam, "Brunette."

Jerseys—Bulls above One and not exceeding Two Years old.

MRS. LEIGH, Luton Hoo Park, Luton, Beds: FIRST PRIZE, 15*l.*, for "Luton Hoo," silver grey, 1 year, 11 months, 3 weeks, 3 days-old; bred by the late Mr. J. G. Leigh, Luton Hoo Park; sire, "Fitz Yankee;" dam, "Topsey."

JOHN CHARLES F. RAMSDEN, Busbridge Hall, Godalming, Surrey: SECOND PRIZE, 10*l.*, for "Mohawk," black and silver grey, 1 year, 4 months, 6 days-old; bred by himself; sire, "Modoc;" dam, "Violet."

THOMAS BARKER MILLER, Bishop's Stortford: THIRD PRIZE, 5*l.*, for "Nobleman," silver grey, 1 year, 7 months, 3 weeks, 1 day-old; bred by Mr. Walter Gilbey; sire, "Ducal;" dam, "Lady Grey," by "Clement."

LORD CHESHAM, Latimer, Chesham, Bucks: the *Reserve Number*, to "Fanfaron," silver grey, 1 year, 11 months, 4 weeks, 1 day-old; bred by Mr. W. Gilbey; sire, "Banboy;" dam, "Fan."

Jerseys—Cows above Three Years old.

GEORGE SIMPSON, Wray Park, Reigate: FIRST PRIZE, 15*l.*, for "Prettymaid," grey fawn, 7 years, 4 months-old, in-milk; bred by Mr. J. Picot, St. John's, Jersey. Calved April 5, 1876.

CHRISTOPHER JOHN HUME TOWER, Weald Hall, Brentwood: SECOND PRIZE, 10*l.*, for "Victoria," smoky fawn, aged, in-milk and in-calf; bred by Mr. W. Gilbey. Calved November 24, 1875.

GEORGE DIGBY WINGFIELD DIGBY, Sherborne Castle: THIRD PRIZE, 5*l.*, for "Diamond," light fawn, 9 years, 7 months-old, in-calf; bred by Exhibitor.

LORD CHESHAM, Latimer, Chesham, Bucks: the *Reserve Number*, to "Dora," silver grey, 4 years, 9 months, 6 days-old, in-milk and in-calf; bred by himself; sire, "Dandy;" dam, "Dairymaid." Calved June 7, 1875.

Jerseys—Heifers, in-milk or in-calf, not exceeding Three Years old.

GEORGE SIMPSON, Wray Park, Reigate: FIRST PRIZE, 15*l.*, for "Lemonpeel 2nd," greyish fawn, 2 years, 2 months, 3 weeks, 6 days-old, in-milk; bred by Mr. J. Le Templier, St. Clement's, Jersey; sire, "Hero" (157); dam, "Lemon-peel" (754). Calved May 24, 1876.

CECIL BERNARDINO DIXON, The Vinery, Shirley Warren, Southampton: SECOND PRIZE, 10*l.*, for "Brunette," grey fawn, 1 year, 2 months, 1 week, 2 days-old, in-calf; bred by himself; sire, "Hector;" dam, "Brownie."

THE REV. MORTON SHAW, Rougham Rectory, Bury St. Edmunds, THIRD PRIZE, 5*l.*, for "Lilac," silver grey, 1 year, 10 months, 1 week, 2 days-old, in-milk; bred by himself; sire, "Ducal;" dam, "Veronica," by "Vampire 2nd." Calved April 9, 1876.

CECIL BERNARDINO DIXON, The Vinery, Shirley Warren, Southampton: the *Reserve Number*, to "Grizette," silver grey, 2 years, 1 month, 1 week, 6 days-old, in-milk; bred by Mr. C. Vibert, St. Ouen's, Jersey; sire, "Prince;" dam, "La Grise."

Guernseys—Bulls above One Year old.

ROBERT N. G. BAKER, Heavitree, Devon: FIRST PRIZE, 10*l.*, for "Johnnie," red and white, 3 years, 7 months-old; bred by Mr. Brune, Guernsey; sire, "Champion;" dam, "Polly."

WILLIAM HOOD WALROND, New Court, Topsham, Devon: SECOND PRIZE, 5*l.*, for "Young Duke," yellow and white, 2 years, 8 months-old; bred by Mr. Rendle, Catel Farm, Guernsey; sire, "Billy;" dam, "Duchess," by "Marquis."

WILLIAM EDWARD FITT, Kerrfield House, Winchester: the *Reserve Number*, to "Fairlad," yellow and white, 2 years, 1 week, 4 days-old; bred by Mr. T. Monelgried, Guernsey; sire, "Billy;" dam, "Polly."

Guernseys—Cows above Three Years old.

ROBERT N. G. BAKER, Heavitree: FIRST PRIZE, 10*l.*, for "Nellie," yellow and white, 4 years, 4 months, 2 weeks-old, in-milk; bred by Mr. Fallaize, Les Martins, St. Martin's, Guernsey; sire, "Billy."

WILLIAM EDWARD FITT, Kerrfield House, Winchester: SECOND PRIZE, 5*l.*, for "Playful," yellow and white, 4 years, 1 month, 1 week-old, in-calf; breeder unknown.

ROBERT N. G. BAKER, Heavitree: the *Reserve Number*, to "Snowdrop," fawn and white, 3 years, 9 months, 2 weeks-old, in-calf; bred by himself; sire, "Highland Bull;" dam, "Primrose."

Guernseys—Heifers, in-milk or in-calf, not exceeding Three Years old.

ROBERT N. G. BAKER, Heavitree: FIRST PRIZE, 10*l.*, for "Rose," red and white, 2 years, 5 months, 1 week, 4 days-old, in-milk; bred by Mr. Gallume, Guernsey; sire, "Johnnie." Calved in April: and the *Reserve Number*, to "Lady Elizabeth," fawn, 2 years, 2 months, 2 weeks-old, in-calf; bred by Mr. Ogier, Guernsey; sire, "Excelsior."

Sussex—Bulls above Three Years old.

JOHN TURVILL, Hartley Park Farm, Alton, Hants: FIRST PRIZE, 15*l.*, for "Tom," 3 years, 5 months, 3 weeks, 1 day-old; bred by himself; dam, "Daisy."

EDWARD and ALFRED STANFORD, Eatons, Ashurst, Steyning, Sussex: SECOND PRIZE, 10*l.*, for "Dorchester," 4 years, 7 months, 3 weeks-old; bred by themselves; sire, "Volunteer;" dam, "Mary Fern."

JAMES BRABY, Maybanks, Rudgwick, Sussex: the *Reserve Number*, to "Grand Duke 2nd" (202), 3 years, 10 months, 1 week, 4 days-old; bred by Mr. Agate, West Street, Horsham; sire, "Grand Duke" (183); dam, "Pera" (1350).

Sussex—Bulls above Two and not exceeding Three Years old.

HENRY HERBERT HAMMOND, Horsell, Woking Station, Surrey: FIRST PRIZE, 15*l.*, for "Hartley 1st," 2 years, 8 months, 2 weeks, 2 days-old; bred by Mr. J. Turvill, of Hartley Park Farm, Alton; sire, "Hartley; dam, "Colly."

CHARLES WHITEHEAD, Barming House, Maidstone: SECOND PRIZE, 10*l.*, for "May-Duke" (252), 2 years, 8 months, 2 weeks, 1 day-old; bred by Mr. R. Durrant, Froghole, Mayfield, Sussex; dam, "Curly Smith No. 4."

JAMES BRABY, Maybanks, Rudgwick: the *Reserve Number*, to "Headley" (248), 2 years, 7 months, 2 weeks, 4 days-old; bred by Mr. J. Turvill, Hartley Park, Alton; sire, "Hartley; dam, "Gentle," by "Westminster" (138).

Sussex—Yearling Bulls above One and not exceeding Two Years old.

GEORGE SMITH, Raddockhurst, Crawley, Sussex: FIRST PRIZE, 10*l.*, for "Young Hartley," 1 year, 11 months, 2 weeks-old; bred by himself; sire, "Hartley;" dam, "Young Broad," by "Slinfold."

JOHN AND ALFRED HEASMAN, Angmering, Arundel, Sussex: SECOND PRIZE, 5*l.*, for "Croydon" (245), 1 year, 11 months, 3 weeks, 4 days-old; bred by themselves;" sire, "Lord of Lorne" (207), dam, "Reeve."

CHARLES WHITEHEAD, Barming House, Maidstone: the *Reserve Number*, to "Kentish Red No. 2," 1 year, 3 months-old; bred by himself; sire, "Kentish Red No. 1" (188); dam, "Whiteheart."

Sussex—Cows above Three Years old.

CHARLES CHILD, Park House, Slinfold, Horsham, Sussex: FIRST PRIZE, 15*l.*, "Jewel," 5 years, 6 months, 2 weeks, 3 days-old, in-milk and in-calf; bred by himself; sire, "Baron" (163); dam, "Jewess," by "Bouncer" (124). Calved Nov. 24, 1875.

EDWARD AND ALFRED STANFORD, Eatons, Ashurst, Steyning: SECOND PRIZE, 10*l.*, for "Dorset," 6 years-old, in-calf; bred by themselves; sire, "Young Westminster."

ALFRED AGATE, West Street, Horsham: the *Reserve Number*, to "Auburn," 4 years, 8 months, 5 days-old, in-calf; bred by himself; sire, "Grand Duke" (183); dam, "Grand Duchess" (1169), by "Crown Prince."

Sussex—Heifers in-milk or in-calf, above Two and not exceeding Three Years old.

ALFRED AGATE, West Street, Horsham: FIRST PRIZE, 15*l.*, for "Honesty 1st," 2 years, 7 months, 1 week-old, in-calf; bred by himself; sire, "Alfred 2nd" (177); dam, "Honesty" (1333).

EDWARD AND ALFRED STANFORD, Eatons, Ashurst, Steyning: SECOND PRIZE, 10*l.*, for "Rosedew," 2 years, 11 months, 4 days-old, in-calf; bred by himself; sire, "Dorchester."

JAMES BRABY, Maybanks, Rudgwick, Sussex: the *Reserve Number*, to "Pink 3rd," 2 years, 5 months, 3 weeks, 3 days-old, in-calf; bred by Mr. G. Smith, Paddockhurst, Crawley; sire, "Esquire;" dam, "Pink 2nd," by "Young Sultan."

Sussex—Yearling Heifers, above One and not exceeding Two Years old.

EDWARD AND ALFRED STANFORD, Eatons, Ashurst, Steyning: FIRST PRIZE, 10*l.*, for "Rosedew 2nd," 1 year, 11 months, 2 weeks, 2 days-old; bred by themselves; sire, "Dorchester."

BLAKE DUKE, Lyminster, Arundel, Sussex: SECOND PRIZE, 5*l.*, for "Young Barmaid" (1673), 1 year, 10 months, 3 weeks-old; bred by himself; sire, "Sir Roger" (194); dam, "Barmaid" (1286), by "Berry the Younger."

ALFRED AGATE, West Street, Horsham: the *Reserve Number*, to "Adelaide 5th," 1 year, 9 months, 4 days-old; bred by himself; sire, "Alfred 2nd" (177); dam, "Adelaide 3rd" (1372).

*Longhorns—Bulls over Two Years old.**

THE DUKE OF BUCKINGHAM AND CHANDOS, Stowe, Buckingham: FIRST PRIZE, 20*l.*, for "Conqueror 3rd," brindle and white, 4 years, 11 months, 3 weeks old; bred by himself; sire, "Young Conqueror," dam, "Lady."

FREDERICK TOMLINSON, Southwood, Ticknall, Derbyshire: SECOND PRIZE, 10*l.*, for "Peeping Tom," brindled, 3 years, 1 month-old; bred by Mr. Weston, Whitacre, Warwickshire.

WILLIAM SMITH SHAW, Fradley Old Hall, Lichfield: THIRD PRIZE, 5*l.*, for "Earl of Upton 7th," light brindled, 4 years, 3 months, 2 weeks, 2 days-old; bred by Mr. R. H. Chapman, St. Asaph; sire, "Earl of Warwick;" dam "Lady Upton 73rd," by "Old Sparkenhoe."

SAMUEL FORREST, The Chase, Kenilworth, the *Reserve Number*, to "Crown Prince," red and white, 6 years, 3 months, 2 weeks, 4 days-old; bred by Mr. J. H. Burbery, Montague House, Kenilworth; dam, "Daisy."

*Longhorns—Bulls over One, and not exceeding Two Years old.**

THE DUKE OF BUCKINGHAM AND CHANDOS, Stowe: FIRST PRIZE, 10*l.*, for "The Marquis," brindle and white, 1 year, 3 months, 4 days-old; bred by himself; sire, "Conqueror 3rd;" dam, "Wildfire."

JOHN GODFREY, Wigston Parva, Hinckley, Leicestershire: SECOND PRIZE, 5*l.*, for "Tiger," red and white, 1 year, 5 days-old; bred by himself; sire, "Blue Knight;" dam, "Daisy," by "Shakespere."

THE DUKE OF BUCKINGHAM AND CHANDOS, Stowe: the *Reserve Number*, to "Earl of Dadford," brindle, 1 year, 2 months, 3 days-old; bred by himself; sire, "Earl of Upton 3rd;" dam, "Rose," by "Earl of Warwick."

*Longhorns—Cows over Three Years old.**

SAMUEL FORREST, The Chase, Kenilworth: FIRST PRIZE, 20*l.*, for "Lady," brindle and white, 6 years, 3 months, 5 days-old, in-milk and in-calf; calved October 22, 1875; dam, "Beauty": and SECOND PRIZE, 10*l.*, for "Bluebell," brindle and white, 6 years, 2 months, 1 week, 3 days-old, in-milk, calved Feb. 25, 1876: both bred by Mr. J. H. Burbery, Montague House, Kenilworth; dam, "Bluebell."

THOMAS SATCHWELL, Hernfield, Knowle, Warwickshire: THIRD PRIZE, 5*l.*, for "Rosemary," red and white, 3 years, 2 months, 2 weeks-old, in-milk; calved May 20, 1876; bred by himself; sire, "Red Lion;" dam, "Valentine," by "Monarch": and the *Reserve Number*, to "Lady Forest," red, 3 years, 2 months, 3 weeks old, in-milk; bred by himself; sire, "Red Lion;" dam, "Brindle Beauty," by "Peeping Tom." Calved March 26, 1876.

*Longhorns—Heifers, in-Milk or in-Calf, over Two and not exceeding Three Years old.**

THE DUKE OF BUCKINGHAM AND CHANDOS, Stowe: FIRST PRIZE, 20*l.*, for "Lady Twycross," red and white, 2 years, 10 months, 3 weeks, 6 days-old, in-calf; bred by himself; sire, "Conqueror 3rd;" dam, "Wildfire": and SECOND PRIZE, 10*l.*, for "Barmaid," brindle, 2 years, 9 months, 2 weeks, 3 days-old, in-calf; bred by himself; sire, "Conqueror 3rd;" dam, "Negress 2nd."

FREDERICK TOMLINSON, Southwood, Ticknall, Derbyshire: THIRD PRIZE, 5*l.*, for "Lady Weston," red and white, 2 years, 4 months-old, in-calf; bred by Mr. Weston, Whitacre, Warwickshire: and the *Reserve Number*, to "Loophorn 4th," strawberry, 2 years, 2 months, 1 week, 6 days-old, in-calf; bred by himself; sire, "Conqueror;" dam, "Loophorn," by "Duke."

*Longhorns—Heifers not exceeding Two Years old.**

THE DUKE OF BUCKINGHAM AND CHANDOS, Stowe: FIRST PRIZE, 20*l.*, for "Countess of Temple," brindle and white, 1 year, 10 months, 4 days-old; bred by himself; sire, "Conqueror 3rd;" dam, "Lady Mary," by "Young Conqueror."

WILLIAM NEALE BERRY, Stoke Golding, Hinckley, Leicestershire: SECOND PRIZE, 10*l.*, for "Pride of the Park," brindle, 1 year, 2 months, 1 day-old; bred by Mr. Nicholas E. Taverner, Upton Park, Nuneaton; sire, "Brindled Boy;" dam, "Beauty," by Mr. Chapman's "Wild Bull": and THIRD PRIZE, 5*l.*, for "Weston's Farewell," red and white, 1 year, 2 months, 3 weeks, 1 day-old; bred by himself; sire, "Royal Duke of Upton 1st;" dam "Damsel," by "Upton Hero."

THOMAS SATCHWELL, Hernfield, Knowle: the *Reserve Number*, to "Bloom," dark brindle and white, 1 year, 3 months, 3 weeks-old; bred by himself; sire, "Ranger;" dam, "Blossom," by "Peeping Tom."

*Pairs of Dairy Cows, in-Milk, over Three Years old.**

RICHARD STRATTON, The Duffryn, Newport, Mon.,: FIRST PRIZE, 25*l.*, for "Alice," roan (Shorthorn), 7 years, 4 months-old; sire, "Orontes" (24,695); "Hanwern 2nd," roan (Shorthorn), 6 years 5 days-old; sire, "Orontes" (24,695); both bred by himself.

THOMAS KINGSLEY, Boar's Croft, Tring, Herts: SECOND PRIZE, 15*l.*, for "Lady Knightley," roan (Shorthorn), 9 years, 2 weeks, 4 days-old; "Old Seraphina," roan (Shorthorn), 10 years, 5 months, 2 weeks, 4 days-old; both bred by himself.

THOMAS STATTER, Stand Hall, Whitefield, Manchester: THIRD PRIZE, 10*l.*, for his red and white (Ayrshires); ages and breeders unknown: and the *Reserve Number*, to his red and white (Ayrshires); ages and breeders unknown.

*Dairy Cows, in-Milk, over Three Years old.**

WILLIAM HERBERT WODEHOUSE, Woolmers Park, Hertford: FIRST PRIZE, 15*l.*, for "Countess," roan (Shorthorn), 8 years, 2 months, 1 week, 1 day-old, in-milk and in-calf, calved January 7, 1876; bred by himself; sire, "Archdale" (21,183); dam "Lily," by son of the "Duke of Argyle" (11,375).

CHARLES COGSWELL, Plimyard Manor, Eastham, Cheshire: SECOND PRIZE, 10*l.*, for his roan, 5 years, 4 months-old, in-milk and in-calf, calved September, 1875; bred by Mr. Torr, Blankfield Farm, Eastham.

THOMAS STATTER, Stand Hall: THIRD PRIZE, 5*l.*, for his Yorkshire; age and breeder unknown.

THOMAS KINGSLEY, Boar's Croft, Tring: the *Reserve Number*, to "Seraphina 1st," roan (Shorthorn), 9 years, 2 weeks, 4 days-old, due to calve July 1st; bred by himself.

SHEEP.

Leicesters—Shearling Rams.

George Turner, Brampford Speke, Exeter: First Prize, 20*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

George Turner, jun., Thorpelands, Northampton: Second Prize, 10*l.*, for his 1 year, 3 months-old: and Third Prize, 5*l.*, for his 1 year, 3 months-old; both bred by himself.

William Brown, High Gate House, Holme-on-Spalding-Moor, Yorkshire: the *Reserve Number*, to his 1 year, 3 months, 2 weeks-old; bred by himself.

Leicesters—Rams of any other age.

George Turner, jun., Thorpelands: First Prize, 20*l.*, for his 3 years, 3 months-old; bred by himself.

Robert Ward Cresswell, Ravenstone, Ashby-de-la-Zouch: Second Prize, 10*l.*, for his 3 years, 4 months-old: Third Prize, 5*l.*, for his 3 years, 4 months-old: and the *Reserve Number* to his 2 years, 4 months-old; all bred by himself.

Leicesters—Pens of Five Shearling Ewes, of the same Flock.

William Brown, High Gate House, Holme-on-Spalding-Moor, Yorkshire: First Prize, 15*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

George Turner, jun., Thorpelands, Northampton: Second Prize, 10*l.*, for his 1 year, 3 months-old; bred by himself.

Thomas Marris, Croxton, Ulceby, Lincolnshire: Third Prize, 5*l.*, for his 1 year, 3 months, 2 weeks-old; bred by the late Mr. Charles Marris, Croxton.

Major R. H. Buller, C.B., Downes, Crediton, Devonshire: the *Reserve Number*, to his 1 year, 3 months, 3 weeks-old; bred by himself.

Cotswolds—Shearling Rams.

Thomas Brown, Marham Hall, Downham Market: First Prize, 20*l.*, for his 1 year, 4 months, 2 weeks-old: and Second Prize, 10*l.*, for his 1 year, 4 months, 2 weeks-old; both bred by himself.

Samuel Smith, Somerton, Deddington, Oxon: Third Prize, 5*l.*, for his 1 year, 3 months, 3 weeks-old; bred by himself.

Russell Swanwick, the Royal Agricultural College Farm, Cirencester: the *Reserve Number*, to his 1 year, 5 months-old; bred by himself.

Cotswolds—Rams of any other Age.

Russell Swanwick, the Royal Agricultural College Farm, Cirencester: First Prize, 20*l.*, for his 2 years, 5 months-old: Second Prize, 10*l.*, for his 3 years, 5 months-old: and the *Reserve Number*, to his 2 years, 5 months-old; all bred by himself.

Cotswolds—Pens of Five Shearling Ewes, of the same Flock.

Russell Swanwick, the Royal Agricultural Farm, Cirencester: First Prize, 15*l.*, for his 1 year, 5 months-old: Second Prize, 10*l.*, for his 1 year, 5 months-old: and **Third Prize**, 5*l.*, for his 1 year, 5 months-old; all bred by himself.

Samuel Smith, Somerton, Deddington, Oxfordshire: the *Reserve Number*, to his ages various; bred by himself.

Lincolns—Shearling Rams.

Edward John Howard, Nocton Rise, Nocton, Lincoln: **First Prize**, 20*l.*, for his 1 year, 4 months-old; bred by himself.

William Francis Marshall, Branston, Lincoln: **Second Prize**, 10*l.*, for his 1 year, 4 months, 2 weeks-old; bred by himself.

Thomas William Daniel Harris, Wootton, Northampton: **Third Prize**, 5*l.*, for his 1 year, 4 months-old; bred by himself.

Henry Smith, The Grove, Cropwell Butler, Bingham, Notts: the *Reserve Number*, to his 1 year, 4 months-old; bred by himself; sire, "T. C."

Lincolns—Rams of any other Age.

John Byron, Kirkby Green, Sleacombe, Lincolnshire: **First Prize**, 20*l.*, for his 2 years, 3 months, 2 weeks-old; bred by himself.

William and Henry Dudding, Panton House, Wragby: **Second Prize**, 10*l.*, for their 3 years, 3 months, 2 weeks-old; bred by themselves.

Robert Wright, Nocton Heath, Lincolnshire: **Third Prize**, 5*l.*, for his 3 years, 4 months-old; bred by the late Mr. Kemp, Thurlby Grange, Alford.

John Pears, Mere, Lincoln: the *Reserve Number*, to his 3 years, 4 months-old; bred by himself.

Lincolns—Pens of Five Shearling Ewes of the same Flock.

Thomas Gunnell, Willow House, Milton, Cambridge: **First Prize**, 15*l.*, for his 1 year, 4 months-old; bred by himself.

Edward John Howard, Nocton Rise, Nocton, Lincolnshire: **Second Prize**, 10*l.*, for his 1 year, 4 months-old: and **Third Prize**, 5*l.*, for his 1 year, 4 months-old; all bred by himself.

John Pears, Mere, Lincoln: the *Reserve Number*, to his 1 year, 4 months-old; bred by himself.

Oxfordshire Downs—Shearling Rams.

Albert Brassey, Heythrop Park, Chipping Norton: **First Prize**, 20*l.*, for his 1 year, 4 months-old; bred by himself.

A. F. Milton Druce, Twelve Acres, Eynsham, Oxon: **Second Prize**, 10*l.*, for his 1 year, 5 months-old; bred by himself.

George Wallis, Old Shifford, Bampton, Faringdon: **Third Prize**, 5*l.*, for his 1 year, 5 months, 2 weeks-old; bred by himself.

John Treadwell, Upper Winchendon, Aylesbury: the *Reserve Number*, to his about 1 year, 4 months, 2 weeks-old; bred by himself.

Oxfordshire Downs—Rams of any other Age.

A. F. Milton Druce, Twelve Acres, Eynsham: **First Prize**, 20*l.*, for his "Freeland," 2 years, 5 months-old; bred by himself; sire, "Burghfield."

George Wallis, Old Shifford, Bampton, Faringdon: Second Prize, 10*l.*, for his 3 years, 5 months, 2 weeks-old; bred by himself.

A. F. Milton Druce, Twelve Acres, Eynsham: Third Prize, 5*l.*, for "Woodstock," 2 years, 5 months-old; bred by himself; sire, "Hull."

John Treadwell, Upper Winchendon, Aylesbury: the *Reserve Number*, to "Whiteleg," about 2 years, 4 months, 2 weeks-old; bred by himself; sire, "Royal Hull."

Oxfordshire Downs—Pens of Five Shearling Ewes, of the same Flock.

A. F. Milton Druce, Twelve Acres, Eynsham: First Prize, 15*l.*, for his 1 year, 5 months-old; bred by himself.

John Treadwell, Upper Winchendon, Aylesbury: Second Prize, 10*l.*, for his about 1 year, 4 months, 2 weeks-old: and Third Prize, 5*l.*, for his about 1 year, 4 months, 2 weeks-old; all bred by himself.

Albert Brassey, Heythrop Park, Chipping Norton, Oxon: the *Reserve Number*, to his 1 year, 4 months-old; bred by himself.

Southdowns—Shearling Rams.

Lord Walsingham, Merton Hall, Thetford: First Prize, 20*l.*, for his 1 year, 4 months-old: and Second Prize, 10*l.*, for his 1 year, 4 months-old; both bred by himself.

Sir Nicholas William Throckmorton, Bart., Buckland, Faringdon, Berkshire: Third Prize, 5*l.*, for his 1 year, 4 months-old; bred by himself.

Lord Walsingham, Merton Hall: the *Reserve Number*, to his 1 year, 4 months-old; bred by himself.

Southdowns—Rams of any other Age.

Lord Walsingham, Merton Hall: First Prize, 20*l.*, for his 2 years, 4 months-old; bred by himself.

Jeremiah James Colman, M.P., Carrow House, Norwich: Second Prize, 10*l.*, for his 2 years, 4 months-old; bred by himself.

Lord Walsingham, Merton Hall: Third Prize, 5*l.*, for his 2 years, 4 months-old: and the *Reserve Number* to his 2 years, 4 months-old; both bred by himself.

Southdowns—Pens of Five Shearling Ewes, of the same Flock.

Lord Walsingham, Merton Hall: First Prize, 15*l.*, for his 1 year, 4 months-old; bred by himself.

Sir Nicholas William Throckmorton, Bart., Buckland, Faringdon, Berkshire: Second Prize, 10*l.*, for his 1 year, 4 months-old; bred by himself.

Jeremiah James Colman, M.P., Carrow House, Norwich: Third Prize, 5*l.*, for his 1 year, 4 months-old; bred by himself.

The Duke of Richmond and Gordon, K.G., Goodwood, Chichester: the *Reserve Number*, to his 1 year, 4 months-old; bred by himself.

Shropshires—Shearling Rams.

JOHN WHITEFOOT MINTON, Forton, Shrewsbury: FIRST PRIZE, 20*l.*, for his 1 year, 4 months, 2 weeks-old; bred by himself; sire, "Duke of Bedford."

LORD CHESHAM, Latimer, Chesham, Bucks: SECOND PRIZE, 10*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself; sire, "Lord Kingston."

HENRY JAMES SHELDON, Brailes House, Shipton-on-Stour: THIRD PRIZE, 5*l.*, for his about 1 year, 3 months, 2 weeks-old; bred by himself.

THOMAS FENN, Stonebrook House, Ludlow: the *Reserve Number*, to his 1 year, 3 months, 2 weeks-old; bred by himself.

Shropshires—Rams of any other Age.

HENRY TOWNSHEND, Caldicote Hall, Nuneaton: FIRST PRIZE, 20*l.*, for "Example," 2 years, 3 months-old; bred by himself.

EDWARD CRANE, Shrawardine, Shrewsbury: SECOND PRIZE, 10*l.*, for "Columbus," 2 years, 3 months, 3 weeks-old; bred by himself.

HENRY JAMES SHELDON, Brailes House: THIRD PRIZE, 5*l.*, for his about 2 years, 3 months, 2 weeks-old; bred by himself.

WILLIAM BAKER, Moor Barns, Atherstone: the *Reserve Number*, to his 2 years, 3 months, 2 weeks-old; bred by himself; sire, "Tarquin."

Shropshires—Pens of Five Shearling Ewes of the same Flock.

LORD CHESHAM, Latimer, Chesham, Bucks: FIRST PRIZE, 15*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

MRS. BEACH, The Hattons, Brewood, Staffs: SECOND PRIZE, 10*l.*, for her 1 year, 4 months-old; bred by herself.

MRS. SMITH, New House, Sutton Maddock, Shifnal: THIRD PRIZE, 5*l.*, for her 1 year, 3 months, 3 weeks-old; bred by herself.

CHARLES BYRD, Littywood, Stafford: the *Reserve Number*, to his 1 year, 4 months-old; bred by himself.

*Shropshires—Pens of Ten Ewes.**

MRS. BEACH, The Hattons, Brewood. FIRST PRIZE, 20*l.*, for her various ages; bred by herself.

THOMAS JAMES MANSELL, Dudmaston Lodge, Bridgnorth: SECOND PRIZE, 10*l.*, for his various ages; bred by himself.

THOMAS MANSELL, Ercall Park, Wellington, Salop: THIRD PRIZE, 5*l.*, for his various ages; bred by himself.

MRS. SMITH, New House, Sutton Maddock, Shifnal: the *Reserve Number*, to her various ages; bred by herself.

*Shropshires—Pens of Ten Ewe Lambs.**

MRS. BEACH, The Hattons, Brewood: FIRST PRIZE, 20*l.*; bred by herself.

THOMAS JAMES MANSELL, Dudmaston Lodge, Bridgnorth: SECOND PRIZE, 10*l.*; bred by himself.

CHARLES BYRD, Littywood, Stafford: THIRD PRIZE, 5*l.*; bred by himself.

Mrs. Smith, New House, Sutton Maddock, Shifnal: the *Reserve Number;* bred by herself.

*Shropshires—Pens of Five Ram Lambs.**

Mrs. Beach, The Hattons, Brewood: First Prize, 20*l.*; bred by herself.

Charles Byrd, Littywood, Stafford: Second Prize, 10*l.*; bred by himself.

Thomas Mansell, Ercall Park, Wellington, Salop: Third Prize, 5*l.*; bred by himself.

Joseph Pulley, Lower Eaton, Hereford: the *Reserve Number;* bred by himself.

*Shropshires—Pens of Five Yearling Wethers.**

Lord Chesham, Latimer, Chesham: First Prize, 20*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself; sire, "Marquis of Bute."

Mrs. Beach, The Hattons, Brewood: Second Prize, 10*l.*, for her 1 year, 3 months, 2 weeks-old; bred by herself.

The Earl of Zetland, Aske, Richmond, Yorkshire: Third Prize, 5*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

William Yates, Grindle House, Shifnal: the *Reserve Number*, to his 1 year, 4 months-old; bred by Mr. George Robinson, Whiston, Shifnal.

*Shropshires—The Exhibitor who secures the greatest number of Marks in all the Classes.**

Mrs. Beach: Plate, value 25*l.*

Hampshires and other Short Wools—Shearling Rams.

Alfred Morrison, Fonthill House, Tisbury, Wilts: First Prize, 20*l.*, for his Hampshire Down, 1 year, 4 months, 2 weeks-old: and Second Prize, 10*l.*, for his Hampshire Down, 1 year, 4 months, 1 week-old; both bred by himself.

George Wood Homer, Athelhampton Hall, Dorchester: the *Reserve Number*, to his Dorsetshire Down, "Burleston," 1 year, 4 months, 3 weeks-old; bred by himself; sire, "Progress."

Hampshires and other Short Wools—Rams of any other Age.

Thomas Chapman Saunders, Watercombe, Dorchester: First Prize, 20*l.*, for his West Country Down, 2 years, 5 months-old: and Second Prize, 10*l.*, for his West Country Down, "Royal Osborne" 2 years, 5 months-old; both bred by himself.

Alfred Morrison, Fonthill House: the *Reserve Number*, to his Hampshire Down, 2 years, 4 months, 2 weeks-old; bred by himself.

Hampshires and other Short Wools—Pens of Five Shearling Ewes, of the same Flock.

Thomas Chapman Saunders, Watercombe: First Prize, 15*l.*, for his West Country Down, 1 year, 5 months, 1 week-old; bred by himself.

George Wood Homer, Athelhampton Hall, Dorchester: Second Prize, 10*l.*, for his Dorsetshire Down, 1 year, 4 months, 3 weeks-old; bred by himself.

JOHN WALTER, M.P., Bearwood, Wokingham, Berks: the *Reserve Number*, to his Hampshire Down, 1 year, 6 weeks-old; bred by himself.

PIGS.

Large White Breed—Boars above Six and not exceeding Twelve Months old.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 10*l.*, for his 11 months, 3 weeks, 5 days-old; bred by himself.

JACOB DOVE, Hambrook House, Hambrook, Bristol: SECOND PRIZE, 5*l.*, for his 10 months, 2 weeks, 3 days-old; bred by himself; sire, "Samson 2nd;" dam, "Bulldog."

ROBERT TOMMAS, Winson Green, Birmingham: the *Reserve Number*, to "The Shah," 11 months, 2 weeks, 3 days-old; bred by himself; sire, "Jerry;" dam, "Winson Green Lass;" sire of dam, "Samson."

Large White Breed—Boars above Twelve Months old.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 10*l.*, for his 4 years, 10 months, 2 weeks, 4 days-old; bred by Mr. J. Bullock, of Idle, Leeds.

RICHARD ELMHIRST DUCKERING, Northorpe, Kirton Lindsey: SECOND PRIZE, 5*l.*, for "Cultivator," 1 year, 11 months, 1 week-old; bred by himself.

THE EARL OF ELLESMERE, Worsley Hall: the *Reserve Number*; age and breeder unknown.

Large White Breed—Pens of Three Breeding Sow Pigs.

JOHN GODFREY, Wigston Parva, Hinckley: FIRST PRIZE, 10*l.*, for his 5 months, 3 weeks, 5 days-old; bred by himself; dam, "Carhead."

JOHN HICKEN, Dunchurch, Rugby: SECOND PRIZE, 5*l.*, for his 5 months, 4 weeks-old; bred by himself: sire, "Bedford;" dam, "Star;" sire of dam, "Dunsmore."

JACOB DOVE, Hambrook House, Bristol: the *Reserve Number*, to his 5 months, 2 weeks, 3 days-old; bred by himself; sire, "Monarch;" dam, "Blanche."

Large White Breed—Breeding Sows.

THE EARL OF ELLESMERE, Worsley Hall: FIRST PRIZE, 10*l.*; age and breeder unknown.

RICHARD ELMHIRST DUCKERING, Northorpe: SECOND PRIZE, 5*l.*, for "Queen," 2 years, 10 months, 3 weeks-old; bred by himself.

JACOB DOVE, Hambrook House: the *Reserve Number*, to his 2 years, 9 months, 3 weeks, 3 days-old; in-pig; bred by himself.

Small White Breed—Boars above Six and not exceeding Twelve Months Old.

JACOB DOVE, Hambrook House, Hambrook, Bristol: FIRST PRIZE, 10*l.*, for his 10 months, 3 weeks, 6 days-old; breeder unknown.

PETER EDEN, Cross Lane, Salford, Manchester: SECOND PRIZE, 5*l.*, for his 10 months, 3 weeks, 3 days-old; bred by himself; sire, "King;" dam, "Rosy;" sire of dam, "Young Prince."

GEORGE MUMFORD SEXTON, Wherstead Hall, Ipswich: the *Reserve Number*, to "Snowball 10th," 9 months, 4 weeks, 1 day-old; bred by himself; sire, "Disturbance;" sire of dam, "Snowball's Son."

Small White Breed—Boars above Twelve Months old.

THE EARL OF ELLESMERE, Worsley Hall: FIRST PRIZE, 10*l.*, for his about 2 years-old; bred by himself.

PETER EDEN, Cross Lane, Salford, Manchester: SECOND PRIZE, 5*l.*, for "David," 1 year, 11 months, 3 days-old; bred by Mr. John Roberts, Newton Heath, Lancashire; sire, "Jimmy Tucker;" dam, "Lucy;" sire of dam, "Young Wonder."

RICHARD ELMHIRST DUCKERING, Northorpe, Kirton Lindsey: the *Reserve Number*, to "Champion," 2 years, 5 months, 2 weeks-old; bred by Mr. J. Harrison, Denton, Lancashire.

Small White Breed—Pens of Three Breeding Sow Pigs.

CHARLES CHARLWOOD, Padworth, Reading: FIRST PRIZE, 10*l.*, for his 5 months, 3 weeks, 6 days-old; bred by himself; sire, "Sir Padworth No. 7;" dam, "Lady Inlease 2nd;" sire of dam, "Inglewood No. 4."

THE EARL OF ELLESMERE, Worsley Hall: SECOND PRIZE, 5*l.*, for his 4 months, 1 week-old; bred by himself.

LORD MORETON, Tortworth Court, Falfield: the *Reserve Number*, to his 4 months, 2 weeks, 1 day-old; bred by himself; sire, "Brother to Triumph;" dam, "Ruffy;" sire of dam, "Young Sam."

Small White Breed—Breeding Sows.

THE EARL OF ELLESMERE, Worsley Hall: FIRST PRIZE, 10*l.* for his 2 year-old; bred by himself.

JACOB DOVE, Hambrook House, Bristol: SECOND PRIZE, 5*l.*, for his about 3 year-old; breeder unknown.

THE EARL OF ELLESMERE, Worsley Hall: the *Reserve Number*, to his 1 year, 6 months-old; in-pig; bred by himself.

Small Black Breed—Boars above Six and not exceeding Twelve Months old.

THE EARL OF PORTSMOUTH, Eggesford House, Wembworyth, Devon: FIRST PRIZE, 10*l.*, for "Gem," 11 months, 4 days-old; bred by himself; dam, "Black Diamond": and SECOND PRIZE, 5*l.*, for "Prince," 10 months, 1 week, 2 days-old; bred by himself; dam, "Queen."

GEORGE MUMFORD SEXTON, Wherstead Hall, Ipswich: the *Reserve Number* to "Bruce," 11 months, 3 weeks-old; bred by himself; sire, "Prince Charlie;" dam, "Adventuress;" sire of dam, "Adventurer."

Small Black Breed—Boars above Twelve Months old.

GEORGE MUMFORD SEXTON, Wherstead Hall: FIRST PRIZE, 10*l.*, for "Kimber," 1 year, 3 months, 2 days-old; bred by himself; sire, "Prince Charlie;"

sire of dam, "Blair Athol": and SECOND PRIZE, 5*l.*, for "Thunder," about 2 years-old; bred by himself; sire, "Adventurer."

THOMAS ROSE, Melton Magna, Wymondham, Norfolk: the *Reserve Number*, to "Othello," 1 year, 3 months, 2 weeks, 5 days-old; bred by himself; sire, "Son of Gladiateur;" dam, "Truth 1st;" sire of dam, "Adventurer."

Small Black Breed—Breeding Sows.

WILLIAM WHEELER, Long Compton, Shipston-on-Stour: FIRST PRIZE, 10*l.*, for his 2 year-old; bred by the late Mr. J. Wheeler and Sons, Long Compton.

GEORGE MUMFORD SEXTON, Wherstead Hall, Ipswich: SECOND PRIZE, 5*l.*, for "Levant," 1 year, 10 months, 1 week-old; bred by himself; sire, "Holy Friar;" dam, "Apology;" sire of dam, "Adventurer": and the *Reserve Number*, to "La Seine," 1 year, 3 months, 1 week-old; in-pig; bred by himself; sire, "Knight of the Garter;" sire of dam, "Blair Athol."

Berkshire Breed—Boars above Six and not exceeding Twelve Months old.

ARTHUR STEWART, Saint Bridge Farm, Gloucester: FIRST PRIZE, 10*l.*, for "Crown Prince 3rd," 9 months, 4 weeks-old; bred by himself; sire, "Robin Hood;" dam, "Princess 5th;" sire of dam, "Tim Whiffler": and SECOND PRIZE, 5*l.*, for "Crown Prince 2nd," 9 months, 4 weeks-old; bred by himself; sire, "Robin Hood;" dam, "Princess 5th;" sire of dam, "Tim Whiffler."

HEBER HUMFREY, Kingstone Farm, Shrivenham, Berks: the *Reserve Number*, to "Maybreeze," 11 months, 2 weeks, 1 day-old; bred by himself; sire, "Lineal Baronet;" dam, "Maybourne's Sister F;" sire of dam, "Gilbourne."

Berkshire Breed—Boars above Twelve Months old.

HEBER HUMFREY, Kingstone Farm, Shrivenham: FIRST PRIZE, 10*l.*, for "Lord Smithereen," 1 year, 11 months, 4 days-old; bred by himself; sire, "Smithereen;" dam, "Slavedriver's Niece;" sire of dam, "No. 317 N."

JOHN SPENCER, Villiers Hill, Kenilworth: SECOND PRIZE, 5*l.*, for "Sambo 3rd," 2 years, 3 weeks, 2 days-old; bred by himself; sire, "Sambo 2nd;" dam, "Princess 9th;" sire of dam, "Lieutenant."

ARTHUR STEWART, Saint Bridge Farm, Gloucester: the *Reserve Number*, to "Robin Hood 2nd," 1 year, 1 month, 2 days-old; bred by himself; sire, "Robin Hood;" dam, "Young Sniper;" sire of dam, "Samson."

Berkshire Breed—Pens of Three Breeding Sow Pigs.

CHARLES MURRAY, The Burry, Offchurch, Leamington: FIRST PRIZE, 10*l.*, for his 4 months, 1 week, 4 days-old; bred by himself.

ARTHUR STEWART, Saint Bridge Farm, Gloucester: SECOND PRIZE, 5*l.*, for his 5 months, 1 week, 3 days-old; bred by himself; sire, "Robin Hood;" dam, "Cirencester;" sire of dam, "Royal Pennant."

SIR NICHOLAS WILLIAM THROCKMORTON, Bart., Buckland, Faringdon: the *Reserve Number*, to his 3 months, 1 week, 4 days-old; bred by himself; sire, "Pudgson;" dam, "Queen;" sire of dam, "Hewer."

Berkshire Breed—Breeding Sows.

William Yells, Knoyle Down, Hindon, Wiltshire: First Prize, 10*l.*, for his 1 year, 5 months-old; bred by himself.

Sir Nicholas William Throckmorton, Bart., Buckland, Faringdon: Second Prize, 5*l.*, for "Young Stourbridge," 2 years, 4 months, 4 days-old; bred by himself; sire, "Hewer;" dam, "Old Stourbridge."

John Spencer, Villiers Hill, Kenilworth: the *Reserve Number*, to "Princess 10th," 2 years, 7 months, 4 weeks-old; bred by himself; sire, "Royal Sambo;" dam, "Lady Fowler;" sire of dam, "Tim Whiffler."

Other Breeds—Boars above Six and not exceeding Twelve Months old.

Richard Elmhirst Duckering, Northorpe, Kirton Lindsey, Lincolnshire: First Prize, 10*l.*, for his Improved Lincolnshire, white, 11 months, 2 weeks-old; bred by himself.

Robert Tommas, Winson Green, Birmingham: Second Prize, 5*l.*, for "Cupid," white, 11 months, 2 weeks, 3 days-old; bred by himself; sire, "Peacock;" dam, "Acorn;" sire of dam, "Victor."

Peter Eden, Cross Lane, Salford, Manchester; the *Reserve Number*, to his white, 10 months, 3 weeks, 2 days-old; bred by himself; sire, "King," dam, "Gipsy;" sire of dam, "Defender."

Other Breeds—Boars above Twelve Months old.

The Earl of Ellesmere, Worsley Hall, Manchester: First Prize, 10*l.*, for his white, 3 year-old; bred by Mr. Samuel Wilson, Tanner's Farm, Ramsbottom.

Robert Tommas, Winson Green, Birmingham: Second Prize, 5*l.*, for "Esau," white, 1 year, 6 months, 2 weeks, 6 days-old; bred by himself; sire, "Jerry;" dam, "Jenny," sire of dam, "Samson."

The Earl of Ellesmere, Worsley Hall: the *Reserve Number*, to his white; age and breeder unknown.

Other Breeds—Pens of Three Breeding Sow Pigs.

Robert Tommas, Winson Green, Birmingham: First Prize, 10*l.*, for "Faith, Hope, and Charity," white, 5 months, 3 weeks, 2 days-old; bred by himself; sire, "Duke of York;" dam, "Sunshine;" sire of dam, "King."

Richard Elmhirst Duckering, Northorpe, Kirton Lindsey: Second Prize, 5*l.*, for his Improved Lincolnshire, white, 3 months, 1 week, 6 days-old; bred by himself.

Other Breeds—Breeding Sows.

Peter Eden, Cross Lane, Salford, Manchester: First Prize, 10*l.*, for "Lady Cobden," white, blue spots, 1 year, 11 months, 2 weeks, 3 days-old; bred by Mr. John Nuttall, Longfield, Heywood; sire, "Tommy Dod;" dam, "Lancashire Lass."

Robert Tommas, Winson Green: Second Prize, 5*l.*, for "Minerva," white, 1 year, 5 months, 2 days-old; bred by himself; sire, "Jerry;" dam, "Fire Queen;" sire of dam, "King."

Peter Eden, Cross Lane, Salford: the *Reserve Number*, to "Columbine" (Middle), white, 2 years, 10 months-old; bred by himself; sire, "Game Boy;" dam, "Queen Bee;" sire of dam, "King Craft."

WOOL.

*Six Teg Long-wool Fleeces.**

THOMAS HARRIS, Stonylane House, Bromsgrove: FIRST PRIZE, 10*l.*, for his Cross Leicester and Shropshire: and SECOND PRIZE, 5*l.*, for his Pure Leicester.

Six Teg Short-wool Fleeces *

JOHN HILL, Felhampton Court, Church Stretton, Shropshire: FIRST PRIZE, 10*l.*, for his Shropshire.

JOHN PEAKE, Mullaghmore, Monaghan, Ireland: SECOND PRIZE, 5*l.*, for his Shropshire.

BUTTER.

*Six Pounds.**

CHARLES PRATT, Budbrooke, Warwick: FIRST PRIZE, 10*l.*

LORD CHESHAM, Latimer, Chesham: SECOND PRIZE, 5*l.*

CHEESE.

Over 6 *inches in thickness.**

ALFRED HISCOCK, Church Farm, West Stour, Gillingham, Dorsetshire: FIRST PRIZE, 15*l.*, and 3*l.* to his DAIRYMAID.

WILLIAM DUDLESTON, New Lodge Farm, Donnington, Newport, Shropshire: SECOND PRIZE, 10*l.*, and 2*l.* to his DAIRYMAID.

JOHN SMITH, Nupdown Farm, Thornbury, Gloucestershire: THIRD PRIZE, 5*l.*, and 1*l.* to his DAIRYMAID.

Not exceeding 6 *inches in thickness.**

RALPH ARNOLD, Shackerstone, Atherstone: FIRST PRIZE, 15*l.*, and 3*l.* to his DAIRYMAID.

JOHN SMITH, Nupdown Farm, Thornbury: SECOND PRIZE, 10*l.*, and 2*l.* to his DAIRYMAID.

ALFRED HISCOCK, Church Farm, West Stour, Gillingham: THIRD PRIZE, 5*l.*, and 1*l.* to his DAIRYMAID.

FARM PRIZES.*

The best managed Farm in Warwickshire, not less than Two Hundred Acres in extent.

HENRY STILGOE, Lower Clopton, Stratford-on-Avon: FIRST PRIZE, 100*l.*

JOHN LANE, Broom Court, Alcester: SECOND PRIZE, 50*l.*

JOHN C. ADKINS, Milcote, Stratford-on-Avon: EXTRA PRIZE, 25*l.*

DISQUALIFICATIONS.

FRANCIS RIDGLEY & Co.'s Hackney Stallion, "Fireaway the Second," and Mr. M. HORDAY'S Pony Gelding, "Little Bob," disqualified on account of their exceeding the stipulated height.

IMPLEMENTS.

Reaping Machines, with Self-Delivery in Sheaf, clear of the Horse-Track.

Richard Hornsby and Sons, Spittlegate, Grantham: First Prize, 30*l.*, for their Patent "Spring-Balance" Self-Raking Reaper, marked B; Second Prize, 20*l.*, for their Patent "Spring-Balance" Self-Raking Reaper, marked A; and Third Prize, 10*l.*, for their Patent "Spring-Balance" Self-Raking Reaper, marked D.

Richard Hornsby and Sons: Highly Commended, for their Patent "Spring-Balance" Self-Raking Reaper, marked G; and Highly Commended, for their Patent "Spring-Balance" Self-Raking Reaper, marked E.

The Johnston Harvester Company: Commended, for their New Wrought-Iron Self-Delivery Reaper.

Reaping Machines, with Self-Delivery in Swathe, clear of the Horse-Track.

First Prize, withheld.

The Beverley Iron and Waggon Company, Beverley: Second Prize, 10*l.*, for their Improved Three-horse Reaper, with Double Self-Acting or Reversible Swathe Delivery.

Combined Reaping and Mowing Machine, without Self-Delivery.

Richard Hornsby and Sons: First Prize, 15*l.*, for their Patent "Paragon O" Combined Mower and Reaper: Second Prize, 10*l.*, for their Patent "Paragon N" Combined Mower and Reaper: and Third Prize, 5*l.*, for their Patent "Paragon A" Combined Mower and Reaper.

Richard Hornsby and Sons: Highly Commended, for their Patent "Manchester" Combined Mower and Reaper.

One-horse Reaping Machine.

Richard Hornsby and Sons: First Prize, 15*l.*, for their Patent "Spring-Balance" One-horse Reaper, marked M: Second Prize, 10*l.*, for their Patent "Spring-Balance" One-horse Reaper, marked L: Third Prize, 5*l.*, for their Patent "Premier" One-horse Reaper, marked I.

William Mattison, Leeming Bar, Bedale: Highly Commended, for his One-horse "Champion" Reaper No. II., for Manual Delivery.

MISCELLANEOUS AWARDS

To Agricultural Articles not included in the Ordinary Rotation.

Silver Medals.

J. W. Robinson and Co., for Aspinwall's Patent American Potato Digger.

Hayward, Tyler and Co., for their Caloric Engine.

Marshall, Sons, and Co., for their adaptation of "Band-Cutter" to "Self-feeder."

AGRICULTURAL EDUCATION.

Senior Examination Papers, 1876.

EXAMINATION IN AGRICULTURE.

Maximum Number of Marks, 200. **Pass Number,** 100.

Tuesday, April 18th, from 10 *a.m. till* 1 *p.m.*

1. State the number of loads of farmyard-manure which will be produced by 12 oxen fed upon turnips, linseed-cake, and corn with chaff in an ordinary bullock-yard which has been littered down with 40 tons of mixed wheat and barley straw.

2. How many men, horses, and two-horse carts will be required for filling, removing to a field half-a-mile from the homestead, and there forming into a drawn muck heap, in three days, all the manure made as per question No. 1.

3. Supposing the men filling manure in the previous question are considered to be earning half-a-crown a day, at piece-work, how much per load should they be paid to enable them to do so?

4. Had the manure in question No. 1 been spread instead of carted to a heap, what number of men would be required for the work to complete both operations at the same time?

5. A 20-acre field with an average crop of wheat on a medium soil has to be carried and stacked on the spot. Light two-horse waggons to be used, and the stacks to be round, with bottoms of eight yards diameter. State the number of men, horses, and waggons required for pitching, loading, and stacking the same during one long harvest day, also the number of stacks to be made.

6. There is a 20-acre field of swedes with an average weight of 18 tons to the acre. Half the crop is to be carted to the homestead and consumed in the yards by the oxen, the remainder fed upon the land by hoggets, eating half a pound of cake and corn with chaff, per day, the turnips being cut in the usual way. How many bullocks must be bought for the yards, and how many sheep can be kept from the 1st of November to the 1st of March?

7. A farm of 600 acres consists of 500 acres arable and 100 acres pasture. The former is the light mixed loam, known as turnip and barley land, at a rental of 35*s.* per acre. The pasture is sound dry sheep land. The tenancy is a Michaelmas one. Rotation, four course, with the usual covenants of Norfolk and the Eastern Counties. State

the amount of capital that will be required to stock this farm properly under the following heads, viz.: –

1. Compensation to be paid to the outgoing tenant for hay, young seeds, roots, &c.
2. One year's rent.
3. One year's labour.
4. Live and dead stock.
5. One year's artificial manure and feeding stuffs.
6. Cost of horse keep, seeds, tradesmen's bills, and sundries.

8. Having ascertained the expenditure under the foregoing heads, state the amount to be received during the first year from sales of fat stock, &c., and after deducting this sum from the total outlay, state the amount of capital required to take the farm.

9. State the respective costs of preparing land for wheat and oats on average loam land, the yield and profit per acre you would expect from each crop, and the extent to which present market prices would modify your preference for either cereal.

10. Arrange in order of their manurial value the following feeding stuffs: malt, malt-dust, barley, clover, hay, potatoes, beans, undecorticated cotton-cake, Indian meal, and mangold wurtzel; and state the money value of the manure from five tons each of linseed and decorticated cotton-cake respectively.

11. Under the four course rotation of cropping it is well known that red clover generally fails if sown once in four years. Suggest the best remedy for this by the substitution of other clovers or grasses which would make an equally good preparation for wheat upon light land.

12. How do you account for the Shropshire Downs gradually gaining ground in the Midland and West-Midland Counties, and what advantages have they over the South and Hampshire Downs and white-faced breeds?

13. What is a fair calculation to make of the cost of horse-labour per acre on a mixed soil arable farm of 500 acres? State the number of horses required to work the farm, and tabulate the cost under the following heads, viz:—

Death, risk, and depreciation.
Forty weeks' corn, chaff, hay, &c.
Twelve weeks' corn, green food, &c.
Shoeing, Veterinary, &c.

14. State the cost of growing a crop of Swedes on a medium soil, and give the separate items of cost in detail thus:—

1. Team work.
2. Manual labour.
2. Artificial manure and seed.

15. A field of strong clay loam requires draining, the drains are to be placed 8 yards apart and 4 feet deep. State the number of statute rods per acre which will require cutting, the number of ordinary 2-inch pipes which it will take per acre, the cost per rod of cutting and filling in the drains, the approximate cost of main drains and outlets, and lastly, the cost of the whole operation.

16. What is the best way to improve the quality of the herbage on poor wet grass lands after the water has been removed by drainage. State the weight per acre, and cost of each separate kind of dressing.

17. State the course you would pursue in laying down land to pasture—soil, a good loam—in a western or moderately moist climate. Previous crop, wheat or barley, after fallow, or green crop.

Name the seeds to be sown and the proportions of each.

State the best times of year for sowing, and also the treatment you would recommend for the first three years.

State best manure to apply at time of sowing, and afterwards; also, time of year for application.

State with what stock you would graze the seeds during the time named, or if you would mow them during that time.

State total cost of laying down land to permanent pasture, and if it is advisable to do so, and why.

EXAMINATION IN CHEMISTRY.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

I. GENERAL CHEMISTRY.

Wednesday, April 19th, from 10 *a.m. till* 1 *p.m.*

1. Point out in what respects a mixture like atmospheric air differs from a chemical compound. Under what circumstances can nitrogen be made to unite chemically with oxygen?

2. Explain the changes effected in atmospheric air by burning sulphur in it. Give some account of the properties of the compound of sulphur produced in this way. Why does it stop acetification?

3. What gases are usually dissolved in freshly fallen rain-water? Explain how they may be detected in such water and distinguished.

4. Name the chief natural products containing potassium, and state the general composition of each. Distinguish those which are soluble in water; and explain how you can get into a soluble form those which are insoluble in water.

5. Define a neutral salt. 100 measures of a solution of sulphuric acid are found to dissolve 20 grains of calcium carbonate and no more: calculate how much acid was in the solution. (O : S : C : Ca = 16 : 32 : 12 : 40.)

6. State which of the ordinary compounds of calcium are soluble and which insoluble in water; give the chemical composition of each; and explain how they may be distinguished from the corresponding compounds of magnesium.

7. Give an explanation of the effects of air and water upon lead, showing in what cases water stored in lead tanks is liable to become contaminated with lead; and also how small quantities of lead in solution may be detected.

8. State the composition of the two principal varieties of sugar, and explain how they may be distinguished. Explain also the chemical changes which occur when an infusion of malt is made in cold or tepid water, and how the result is modified by the use of boiling water.

9. How could you demonstrate the presence of nitrogen in gelatine? Of what other elements does it consist? How may it be distinguished from albumen?

10. What is the composition of urea? Explain how it is related to ammonia, and how it may be made to yield ammonia.

II. Agricultural Chemistry.

Wednesday, April 19th, from 2 p.m. till 5 p.m.

1. How can you detect the presence of iron-pyrites and of green-vitriol in a soil, and counteract the injurious effects which these constituents sometimes produce in soils?

2. Mention in general terms the composition of Clay-Marls and Chalk-Marls. How do you distinguish a phosphatic from a common Chalk-Marl?

3. How do you distinguish Suffolk from Cambridge Coprolites? Describe the various steps in analysing Coprolites and the best way of converting Coprolites into Superphosphate.

4. How do you effect the analysis of a Compound Artificial Manure and determine its commercial value.

5. What are the guarantees which you should require of a Manure-dealer in buying:—Nitrate of soda, sulphate of ammonia, shoddy, mineral superphosphate, dissolved bones, raw bone-dust and boiled bones?

6. Mention the principal constituents of barley-meal, beans, wheat, and linseed. Describe their chemical properties and functions in the animal economy.

7. What is the general composition of urine, and what changes do the compounds in it severally undergo by keeping?

8. Write a short paper on the most suitable artificial manures for roots on light and on heavy land.

9. What are the best means of preventing boiler incrustations, resulting from the use of hard waters?

EXAMINATION IN MECHANICS AND NATURAL PHILOSOPHY.

Maximum Number of Marks, 200. Pass Number, 100.

Thursday, April 20th, from 10 *a.m. till* 1 *p.m.*

1. In what three states is matter known to exist? What are the characteristic properties of matter in these states severally as regards the transmission of force?

2. What is the centre of gravity of a body? Where is the centre of gravity of a triangular board situated? If such a board be divided by a line bisecting two of its sides, where will the centres of gravity of its two parts be situated?

3. What is meant by the moment of a force with respect to a point? What general relation exists between the moments of two forces and their resultant all taken with respect to any one point in the plane in which they act?

4. A rod capable of turning round a hinge rests with one end against a smooth vertical wall; explain how to find the pressures on the wall and on the hinge, and find the pressures in the following case:—the rod is of uniform density, weighs 10 lbs, and is inclined to the vertical at an angle of 60°.

5. What is meant by the sensibility of a balance? Other things being the same, the sensibility is greater as the weight of the beam is less—Why is it so?

6. If a body is thrown vertically upwards, why would it return to the hand with a velocity equal to the velocity of projection, were it not for the resistance of the air?

If a body is thrown upwards with a velocity of 48 feet a second, for how long is it at a greater altitude than 20 feet above the point of projection ($g = 32$)?

7. Explain the use of a fly-wheel in an ordinary steam-engine. A steam-engine makes 20 strokes of 6 feet a minute, under an average steam-pressure of 15 lbs. per square inch, the area of the piston being 1000 square inches. Its fly-wheel makes 10 revolutions a minute, and has a radius of 10 ft., what must be its weight, if it have accumulated in it as much work as is done by the steam in one stroke of the engine?

8. Describe briefly a method of finding the specific gravity of a liquid by the balance.

A glass ball weighs 700 grains in air, 4840 grains in water, and 5080 grains in spirits; find the specific gravity of the spirits.

9. What is meant by the boiling- and freezing-points of a thermometer? In what sense can the boiling-point be spoken of as a fixed point?

On the top of a mountain water boils at 85° C., what is this called on Fahrenheit's scale?

EXAMINATION IN MENSURATION AND SURVEYING.

Maximum Number of Marks, 100. Pass Number, 50.

Thursday, April 20th, from 2 p.m. till 5 p.m.

1. Show how to draw through one corner of a rectangular field a straight line to cut off one-third of its area.

2. How many cubic feet of water is a circular tank 20 feet across and 10 feet deep capable of holding?

3. A cutting is 300 feet long, the slope on either side is uniformly 2 feet vertical to 1 foot horizontal, at the bottom the width (which is horizontal) is 20 feet, at the top the width (which is also horizontal gradually increases from 30 feet at one end of the cutting to 50 feet at the other end; find the volume of earth to be moved in making the cutting.

4. A conical tent is 12 feet high on a base 18 feet in diameter; how many yards of canvas 2 feet wide are required to make it (without allowing for waste in cutting)?

5. If the specific gravity of marble is 2·625, how many cubic feet are there in a block weighing 4 tons 15 cwts.?

6. Describe the vernier and explain its use in measuring small distances.

7. A B C are three stations; it is known that from A to B is 756 feet, and that the angle A B C is 37° 15′; the distance from A to C is then measured and found to be 510 feet; determine by construction and calculation the distance B C. Show that there is an ambiguity in your answer, and suggest any way that occurs to you of removing it by a subsidiary observation.

8. The distance between two points is known to be $5\frac{3}{4}$ miles; it is found that on a map they are represented as being 4·6 inches apart; what scale of yards to the inch has been used in making the map?

9. A B C D are four points at the corners of a field; from B to D is 1320 links; plot the accompanying notes and find the area of the field.

	D A	
0	1,200	
70	800	
30	400	
0	000	
Rt.	off	D
	C D	
0	750	
30	420	
	360	0
	300	20
0	220	
50	100	
0	000	
Rt.	off	C
	B C	
0	1,180	
10	800	
10	300	
0	000	
Rt.	off,	B
	A B	
0	520	
30	400	
20	200	
0	000	
Begin at	A & go	North

EXAMINATION IN BOOK-KEEPING.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

Friday, April 21*st, from* 10 *a.m. till* 1 *p.m.*

Journalise and post into a ledger, in proper technical form and language, the following series of facts and transactions, and, from such ledger, make out a Trial Balance, a Profit and Loss Account, and a Balance Sheet.

Liabilities and Assets of JAMES DAWSON, 31*st December*, 1875.

LIABILITIES.

	£	s.	d.
Amount due, W. Williams	670	2	9
Do. J. Smithson	250	4	3
Acceptance to James Brown's Draft, due 25th February, 1876	150	7	0
Acceptance to Robert White's Draft, due 15th January, 1876	240	6	0
	£1,311	0	0

ASSETS.

	£	s.	d.
Stock of Oil-cake, valued at	1000	0	0
Do. Oats	500	0	0
Barley, to arrive, per 'Bella,' cost to date	600	7	6
Horses and Carts	150	0	0
Stock of Provender for Horses	50	0	0
Freehold Premises	700	0	0
Cash at Smith, Payne & Co.	200	0	0
Petty Cash in hand	25	12	6
	£3,226	0	0

1876.

		£	s.	d.
Jan. 1.	Bought of J. Smithson, a parcel of Oats, invoiced at	350	2	6
,, 2.	Accepted W. Williams' Draft, due 5th April	550	0	0
,, ,,	Sold Robert White Oil-cake, charged to him at	525	0	0
,, 3.	Consigned to James Brown, Oil-cake from stock, cost	490	0	0
,, ,,	Sold Arthur Wilkins a parcel of Oats, invoiced at	625	7	8
,, 4.	Received from Arthur Wilkins, his acceptance to my Draft, due 7th April, for ..	500	0	0
	Charged him interest	6	5	8
	Discounted with Bankers, A. Wilkins' Draft, for	500	0	0
	Discount charged by Bankers	5	3	8

		£	s.	d.
Jan. 5.	Paid J. Smithson by Cheque	300	0	0
	Accepted J. Smithson's Draft, due 8th May	250	0	0
„ „	Paid freight on Barley per 'Bella'	68	9	6
„ 7.	Sold J. Brown the parcel of Oil-cake, consigned to him, for	508	4	0
„ 8.	Received of J. Brown, Cash remittance of	508	4	0
„ 9.	Sold J. Smithson the parcel of Barley, per 'Bella,' for	680	8	4
„ 13.	Robert White's acceptance, due 15th, paid into Bankers, and duly met at maturity	240	6	0
	Received of Robert White his acceptance to my Draft, due 5th March, for	275	0	0
	Received of Robert White a remittance of	250	0	0
„ 16.	Office Expenses: paid for Stationery out of Petty Cash	5	4	0
	Drew a Cheque, on account of Petty Cash, for	10	0	0
„ 20.	Sold W. Williams a parcel of Oats, invoiced at	110	5	0
„ 25.	Bought of Arthur Wilkins a parcel of Oats, invoiced at	110	5	6
„ 31.	Cash paid, Salaries and Wages	28	0	0
	Cash drawn out on Private Account	45	0	0
	Interest on Capital, one month at 5 per cent.	7	19	7
	Value of Oats on hand 31st January, 1876	345	15	0
	Stock of Horse provender on hand 31st January, 1876	40	0	0
	Depreciation in value of Premises	3	10	0

EXAMINATION IN GEOLOGY.

MAXIMUM NUMBER OF MARKS, 100. PASS NUMBER, 50.

Friday, April 21st, from 2 p.m. till 5 p.m.

1. How have rocks been classified according to their different modes of origin? Give some examples of rocks belonging to each division.

2. Give the approximate composition of ordinary granite and basalt. State how these rocks are decomposed, and the results of their decomposition.

3. Draw a section across any district exposing the strata between the New Red Sandstone and Oxford Clay. Give the lithological characters of the strata exposed.

4. Mention the relative agricultural value of the soils on the formations occurring along the above section.

5. Explain the origin of springs and bourns.

6. Name some fossils characteristic of the Lias, Oxford, and Kimmeridge clays.

7. Upon what kinds of strata would you expect to find the so-called light and heavy soils and marsh lands. Give examples.

8. Define Conglomerate, Dolomite, Septaria, Hydraulic-limestone, and Gypsum.

9. Give the sub-divisions and mineral characters of the Cretaceous rocks. Mention any important economical substances obtained from them.

10. Enumerate the formations in which the chief phosphatic materials have been found in England, and the forms in which they occur in each.

11. Name the specimens on the table, giving the approximate composition of the rocks and the names and geological position of the fossils.

EXAMINATION IN BOTANY.

[It is expected that Eight Questions at least will be answered.]

MAXIMUM NUMBER OF MARKS, 100. PASS NUMBER, 50.

Saturday, April 22nd, from 10 *a.m. till* 1 *p.m.*

1. Describe the methods of multiplication of the vegetable cell.

2. What is the nature and use of the albumen of plants?

3. Through what organs does the circulation of fluids take place in plants?

4. What is the function of the intercellular spaces in leaves?

5. Mention the different parts of plants which are employed to store starch, and give examples of each.

6. What are the differences between (*a*) the spines of the sloe, (*b*) the spines of the barberry, and (*c*) the prickles of the rose?

7. Explain the nature of (*a*) suckers, (*b*) stolons, and (*c*) runners.

8. What is the difference between the fruits of the strawberry and raspberry?

9. Explain Vernation and Æstivation.

10. Give the technical names and natural orders of the following plants: Goose-grass, Cow-grass, Rib-grass, Canary-grass, Knot-grass, and Timothy-grass.

11. Describe the plants marked *a*, *b*, and *c*, as to the structure and arrangement of the flowers, the form of the leaves, stems, and roots.

EXAMINATION IN ANATOMY AND ANIMAL PHYSIOLOGY.

MAXIMUM NUMBER OF MARKS, 100. PASS NUMBER, 50.

Saturday, April 22nd, from 2 p.m. till 5 p.m.

1. Name the cavity of the body in which the heart is situated; state how it is held in its position and with what organs it is more immediately connected.

2. Name the principal blood-vessels which enter the heart, and those that pass from it, and state the parts of the organ with which they directly communicate. Describe also the difference in colour and chemical composition of the blood found in the vessels.

3. Describe the movements of the heart, how they are produced, and the effects they have upon the blood.

4. State in what essential particulars the eye of the horse and its appendages differ from the eye of man.

MEMORANDA.

Address of Letters.—The Society's office being situated in the postal district designated by the letter W, members, in their correspondence with the Secretary, are requested to subjoin that letter to the usual address.

General Meeting in London, December, 1876.

General Meeting in London, May 22, 1877, at 12 o'clock.

Meeting at Liverpool, July, 1877.

Monthly Council (for transaction of business), at 12 o'clock on the first Wednesday in every month, excepting January, September, and October; open only to Members of Council and Governors of the Society.

Adjournments.—The Council adjourn over Passion and Easter weeks, when those weeks do not include the first Wednesday of the month; from the first Wednesday in August to the first Wednesday in November; and from the first Wednesday in December to the first Wednesday in February.

Office Hours.—10 to 4. On Saturdays, 10 to 2.

Diseases of Cattle, Sheep, and Pigs.—Members have the privilege of applying to the Veterinary Committee of the Society, and of sending animals to the Brown Institution, Wandsworth Road, S.W.—(A statement of these privileges will be found on the opposite page.)

Chemical Analysis.—The privileges of Chemical Analysis enjoyed by Members of the Society will be found stated in this Appendix (p. cxxiv).

Botanical Privileges.—The Botanical Privileges enjoyed by Members of the Society will be found stated in this Appendix (page cxxvi).

Subscriptions.—1. Annual.—The subscription of a Governor is £5, and that of a Member £1, due in advance on the 1st of January of each year, and becoming in arrear if unpaid by the 1st of June. 2. For Life.—Governors may compound for their subscription for future years by paying at once the sum of £50, and Members by paying £10. Governors and Members who have paid their annual subscription for 20 years or upwards, and whose subscriptions are not in arrear, may compound for future annual subscriptions, that of the current year inclusive, by a single payment of £25 for a Governor, and £5 for a Member.

Payments.—Subscriptions may be paid to the Secretary, in the most direct and satisfactory manner, either at the Office of the Society, No. 12 Hanover Square, London, W., or by means of post-office orders, to be obtained at any of the principal post offices throughout the kingdom and made payable to him at the Vere Street Office, London, W.; but any cheque on a bankers or any other house of business in London will be equally available, if made payable on demand. In obtaining post-office orders care should be taken to give the postmaster the correct initials and surname of the Secretary of the Society (H. M. Jenkins), otherwise the payment will be refused to him at the post-office on which such order has been obtained; and when remitting the money-orders it should be stated by whom and on whose account they are sent. Cheques should be made payable as drafts on demand (not as bills only payable after sight or a certain number of days after date), and should be drawn on a London (not on a local country) banker. When payment is made to the London and Westminster Bank, St. James's Square Branch, as the bankers of the Society, it will be desirable that the Secretary should be advised by letter of such payment, in order that the entry in the bankers book may be at once identified and the amount posted to the credit of the proper party. No coin can be remitted by post, unless the letter be registered.

New Members.—Every candidate for admission into the Society must be proposed by a Member; the proposer to specify in writing the full name, usual place of residence, and post-town, of the candidate, either at a Council meeting or by letter addressed to the Secretary. Forms of Proposal may be obtained on application to the Secretary.

⁂ Members may obtain on application to the Secretary copies of an Abstract of the Charter and Bye-laws of a Statement of the General Objects, &c., of the Society, of Chemical, Botanical, and Veterinary Privileges, and of other printed papers connected with special departments of the Society's business.

Members' Veterinary Privileges.

I.—SERIOUS OR EXTENSIVE DISEASES.

No. 1. Any Member of the Society who may desire professional attendance and special advice in cases of serious or extensive disease among his cattle, sheep, or pigs, and will address a letter to the Secretary, will, by return of post, receive a reply stating whether it be considered necessary that the Society's Veterinary Inspector should visit the place where the disease prevails.

No. 2. The remuneration of the Inspector will be 2*l.* 2*s.* each day as a professional fee, and 1*l.* 1*s.* each day for personal expenses; and he will also be allowed to charge the cost of travelling to and from the locality where his services may have been required. The fees will be paid by the Society, but the travelling expenses will be a charge against the applicant. This charge may, however, be reduced or remitted altogether at the discretion of the Council, on such step being recommended to them by the Veterinary Committee.

No. 3. The Inspector, on his return from visiting the diseased stock, will report to the Committee, in writing, the results of his observations and proceedings, which Report will be laid before the Council.

No. 4. When contingencies arise to prevent a personal discharge of the duties confided to the Inspector, he may, subject to the approval of the Committee, name some competent professional person to act in his stead, who shall receive the same rates of remuneration.

II.—ORDINARY OR OTHER CASES OF DISEASE.

Members may obtain the attendance of the Veterinary Inspector on any case of disease by paying the cost of his visit, which will be at the following rate, viz., 2*l.* 2*s.* per diem, and travelling expenses. Applications should be addressed to the Superintendent of the Brown Institution, care of the Secretary of the Royal Agricultural Society, 12, Hanover Square, London, W.

III.—CONSULTATIONS WITHOUT VISIT.

Personal consultation with Veterinary Inspector	5*s.*
Consultation by letter	5*s.*
Consultation necessitating the writing of three or more letters	10*s.*
Post-mortem examination, and report thereon	10*s.*

A return of the number of applications from Members of the Society during each half-year is required from the Veterinary Inspector.

IV.—ADMISSION OF DISEASED ANIMALS TO THE BROWN INSTITUTION, WANDSWORTH ROAD, LONDON, S.W.; INVESTIGATIONS, LECTURES, AND REPORTS.

No. 1. All Members of the Society have the privilege of sending cattle, sheep, and pigs to the Infirmary of the Brown Institution, on the following terms; viz., by paying for the keep and treatment of cattle 10*s.* 6*d.* per week each animal, and for sheep and pigs "a small proportionate charge to be fixed by the Professor-Superintendent according to circumstances."

No. 2. The Professor-Superintendent of the Institution has also undertaken to carry out such investigations relating to the nature, treatment, and prevention of diseases of cattle, sheep, and pigs, as may be deemed expedient by the Council.

No. 3. A detailed Report of the cases of cattle, sheep, and pigs treated in the Infirmary of the Institution, or on Farms in the occupation of Members of the Society, will be furnished to the Council quarterly; and also special reports from time to time on any matter of unusual interest which may come under the notice of the Institution.

By Order of the Council,
H. M. JENKINS, *Secretary.*

Members' Privileges of Chemical Analysis.

The Council have fixed the following rates of Charge for Analyses to be made by the Consulting Chemist for the *bonâ fide* use of Members of the Society; who (to avoid all unnecessary correspondence) are particularly requested, when applying to him, to mention the kind of analysis they require, and to quote its number in the subjoined schedule. The charge for analysis, together with the carriage of the specimens, must be paid to him by members at the time of their application.

No. 1.	An opinion of the genuineness of Peruvian guano, bone-dust, or oil-cake (each sample)	5s.
„ 2.	An analysis of guano; showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts, and ammonia	10s.
„ 3.	An estimate of the value (relatively to the average of samples in the market) of sulphate and muriate of ammonia, and of the nitrates of potash and soda	10s.
„ 4.	An analysis of superphosphate of lime for soluble phosphates only	10s.
„ 5.	An analysis of superphosphate of lime, showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime, and ammonia	£1.
„ 6.	An analysis (sufficient for the determination of its agricultural value) of any ordinary artificial manure	£1.
„ 7.	Limestone:—the proportion of lime, 7*s.* 6*d.*; the proportion of magnesia, 10*s.*; the proportion of lime and magnesia	15*s.*
„ 8.	Limestone or marls, including carbonate, phosphate, and sulphate of lime, and magnesia with sand and clay	£1.
„ 9.	Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime	£1.
„ 10.	Complete analysis of a soil	£3.
„ 11.	An analysis of oil-cake, or other substance used for feeding purposes; showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre; as well as of starch, gum, and sugar, in the aggregate	£1.
„ 12.	Analyses of any vegetable product	£1.
„ 13.	Analyses of animal products, refuse substances used for manure, &c.	from 10s. to 30s.
„ 14.	Determination of the "hardness" of a sample of water before and after boiling	10s.
„ 15.	Analysis of water of land drainage, and of water used for irrigation	£2.
„ 16.	Determination of nitric acid in a sample of water	£1.

N.B.—*The above Scale of Charges is not applicable to the case of persons commercially engaged in the Manufacture or Sale of any Substance sent for Analysis.*

The Address of the Consulting Chemist of the Society is, Dr. Augustus Voelcker, F.R.S., 11, Salisbury Square, London, E.C., to which he requests that all letters and parcels (Postage and Carriage paid) should be directed.

By Order of the Council,
H. M. JENKINS, *Secretary.*

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

ARTIFICIAL MANURES.—Take a large handful of the manure from three or four bags, mix the whole on a large sheet of paper, breaking down with the hand any lumps present, and fold up in tinfoil, or in oil silk, about 3 oz. of the well-mixed sample, and send it to 11, SALISBURY SQUARE, FLEET STREET, E.C., by post: or place the mixed manure in a small wooden or tin box, which may be tied by string, but must not be sealed, and send it by post. If the manure be very wet and lumpy, a larger boxful, weighing from 10 to 12 oz., should be sent either by post or railway.

Samples not exceeding 4 oz. in weight may be sent by post, by attaching two penny postage stamps to the parcel.

Samples not exceeding 8 oz., for three postage stamps.

Samples not exceeding 12 oz., for four postage stamps.

The parcels should be addressed: DR. AUGUSTUS VOELCKER, 11, SALISBURY SQUARE, FLEET STREET, LONDON, E.C., and the address of the sender or the number or mark of the article be stated on parcels.

The samples may be sent in covers, or in boxes, bags of linen or other materials. No parcel sent by post must exceed 12 oz. in weight, 1 foot 6 inches in length, 9 inches in width, and 6 inches in depth.

SOILS.—Have a wooden box made 6 inches long and wide, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil with its subsoil from 9 to 12 inches deep; trim this block or plan of the field to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up, gently turn over the box, nail on the lid and send it by goods or parcel to the laboratory. The soil will then be received in the exact position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

WATERS.—Two gallons of water are required for analysis. The water, if possible, should be sent in glass-stoppered Winchester half-gallon bottles, which are readily obtained in any chemist and druggist's shop. If Winchester bottles cannot be procured, the water may be sent in perfectly clean new stoneware spirit-jars surrounded by wickerwork. For the determination of the degree of hardness before and after boiling, only one quart wine-bottle full of water is required.

LIMESTONES, MARLS, IRONSTONES, AND OTHER MINERALS.—Whole pieces, weighing from 3 to 4 oz., should be sent enclosed in small linen bags, or wrapped in paper. Postage 2*d*., if under 4 oz.

OILCAKES.—Take a sample from the middle of the cake. To this end break a whole cake into two. Then break off a piece from the end where the two halves were joined together, and wrap it in paper, leaving the ends open, and send parcel by post. The piece should weigh from 10 to 12 oz. Postage, 4*d*. If sent by railway, one quarter or half a cake should be forwarded.

FEEDING MEALS.—About 3 oz. will be sufficient for analysis. Enclose the meal in a small linen bag. Send it by post.

On forwarding samples, separate letters should be sent to the laboratory, specifying the nature of the information required, and, if possible, the object in view.

H. M. JENKINS, *Secretary.*

Members' Botanical Privileges.

The Council have provisionally fixed the following Rates of Charge for the examination of Plants and Seeds for the *bonâ fide* use of Members of the Society, who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined Schedule. The charge for examination must be paid to the Consulting Botanist at the time of application, and the carriage of all parcels must be prepaid.

No. 1.—A general opinion as to the genuineness and age of a sample of clover-seed (each sample)	5*s.*
„ 2.—A detailed examination of a sample of dirty or impure clover-seed, with a report on its admixture with seeds of dodder or other weeds (each sample)	10*s.*
„ 3.—A test examination of turnip or other cruciferous seed, with a report on its germinating power, or its adulteration with 000 seed (each sample)	10*s.*
„ 4.—A test examination of any other kind of seed, or corn, with a report on its germinating power (each sample) ..	10*s.*
„ 5.—Determination of the species of any indigenous British plant (not parasitic), with a report on its habits (each species)	5*s.*
„ 6.—Determination of the species of any epiphyte or vegetable parasite, on any farm-crop grown by the Member, with a report on its habits, and suggestions (where possible) as to its extermination or prevention (each species) ..	10*s.*
„ 7.—Report on any other form of plant-disease not caused by insects	10*s.*
„ 8.—Determination of the species of a collection of natural grasses indigenous to any district on one kind of soil (each collection)	10*s.*

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES.

In sending seed or corn for examination the utmost care must be taken to secure a fair and honest sample. If anything supposed to be injurious or useless exists in the corn or seed, selected samples should also be sent.

In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. Place them in a bottle, or pack them in tin-foil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

N.B.—*The above Scale of Charges is not applicable in the case of Seedsmen requiring the services of the Consulting Botanist.*

Parcels or letters (Carriage or Postage prepaid) to be addressed to Mr. W. CARRUTHERS, F.R.S., 4, Woodside Villas, Gipsy Hill, S.E.

H. M. JENKINS, *Secretary.*

GOVERNORS AND MEMBERS

OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

1876.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Patroness,

HER MAJESTY THE QUEEN.

List of Governors and Members.

Life Governors and Life Members are distinguished thus †.

BEDFORDSHIRE.

Governors.

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†Whitbread, William H....Southill House, Bedford

Members.

Addington, Rev. H....Henlow Grange, Biggleswade
Baker, G. W....Luton Hoo Park Office, Luton
Barnard, Edward...Bidwell Farm, Dunstable
Barnard, Thomas...Cople House, Bedford
†Barnett Charles...Stratton Park, Biggleswade
†Barnett, John James ..Langford, Biggleswade
†Bassett, F., M.P....The Heath, Leighton Buzzard
†Blundell, John H....Woodside, Luton
Bowick, Thomas...Bedford
Burgoyne, Sir J. M., Bt., M.P....Sutton Park, Sandy
†Campion, Rev. J. G. C...Westoning Manor, Woburn
Church, George...Bedford
Clarke, William...Beach Farm, Luton
Corcoran, James...High Street, Bedford
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†Crawley, John S....Stockwood Park, Luton
Denne, William...Three Counties Asylum, Arlesey
†Duncombe, Hon. O....Waresley Park, Biggleswade
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Fowler, Francis...Henlow, Biggleswade
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Ginger, D. Lee...The Bury, Stapton, Leighton Buzzard
Hanmer, W. E. Stockgrove, Leighton Buzzard
Hayward, C. Cooper...Southill, Biggleswade
Higgins, George...Castle Close, Bedford
Higgins, Colonel W. B....Picts' Hill, Bedford
Hine, George, jun....Oakley, Bedford
†Horrell, Robert...Oakley, Bedford
Horsford, James...7, Well Street, Bedford
†Howard, Charles...Biddenham, Bedford
†Howard, James...Bedford
James, John Prole...Cople, Bedford
Kilpin, W. Wells...Bickerings Park, Woburn
Lester, James...Kempston, Bedford
Lester, Thomas...High Street, Bedford
Lindsell, Lieut-Colonel..Fairfield House, Biggleswade
Macan, Turner A....Elstow, Bedford
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Phillips, Zachariah ..Birchmoor, Woburn
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Purser, William...Cople, Bedford
†Ransome, Edwin...Kempston, Bedford
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Stimson, William...Marston, Ampthill
Street, George...Maulden, Ampthill
Thomas, John...Bletsoe, Bedford
Thornton, Harry...Goldington Bury, Bedford
Trethewy, Henry...Silsoe
†Trethewy, Henry, jun....Silsoe
†Vallentine,R.,Burcott Lodge Farm,Leighton Buzzard
†Walker, John...Goldington, Bedford
Winters, George...Stratton, Biggleswade
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Allen, George...The Manor Farm, Old Windsor
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Armstrong, H., M.D....Brook House, Bracknell
Attenborough, Richard...Whilby Grove, Reading
Badcock, Richard...Abingdon
Bailey, J. B....4, Coley Hill, Reading
Barrett, John B....Milton House, Steventon
†Barrington, Viscount, M.P....Beckett, Shrivenham
Baskerville, Henry...Crawshay Park, Reading
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Boydell, Harry S....Sulham, Reading
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†Cherry, Geo. Charles...Denford House, Hungerford
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†Dunn, W. H....Inglewood, Hungerford
Dunning, Thomas T. W....Wokingham
Dupuis, Rev. G. J....Eton College, Windsor
Dutton, John...Curbridge, Faringdon
Evans, J. Russell...Burghclere, Newbury
Eyre, Henry R....Shaw House, Newbury
Forbes, John M....Dropmore, Maidenhead
†Fox, William...Adbury, Newbury
†Franklin, Thomas...Ascott, Wallingford
†Franklin, W. Taylor...Ascott, Wallingford
†Garland, T. Bland...Hillfields, Reading
Garth, T. C....Haines Hill, Reading
Gillett, Charles...Lower Haddon, Faringdon
Gillett, Stephen G....Kilkenny, Faringdon
†Goodlake, F. Mills...Wadley House, Faringdon
†Gower, John Leveson...Bill Hill, Wokingham
Gurney, E. Tritton...Nuthanger, Newbury
Hanbury, George...Blythewood, Maidenhead
Hannam, H. J....Burcote, Abingdon
†Harper, Latimer...Chilton Cottage, Hungerford
Hercy, John...Cruchfield House, Maidenhead
Hewer, Robert...Sandhill, Shrivenham
†Hibbert, John...Braywick Lodge, Maidenhead
Hilliard, Rev. J. A. S....Little Wittenham, Abingdon
Holloway, Thomas...Tittenhurst Lodge, Sunninghill
Hopkins, John...Tidmarsh House, Reading
†Howard, Hon. James...Hazelby, Newbury
Humfrey, Heber...Ashbury, Shrivenham
Hunter, H. L....Beech Hill, Reading
Jemmett, Alexander...Binfield, Bracknell
†Jenkins, John B...Kingstowne House, Abingdon
Johnson, Joseph...High Street, Windsor
Johnston, A. R..Heatherley,Crowthorne,Wokingham
Jowett, Rev. J. F...Kingston Bagpuze, Abingdon
Kimber, James W...Fyfield Wick, Abingdon
†King, John G...Beedon, Newbury
King, J. Pittman...North Stoke, Wallingford
King, W. C....Warfield Hall, Bracknell
†Kingsmill, W. H....Sydmonton Court, Newbury
Kirkaldie, Viscount...Windsor
†Lane, Lieut.-Colonel...Lilly Hill, Bracknell
†Latham, Thomas...Little Wittenham, Abingdon
Lee, Captain John....Woolley Firs, Maidenhead
Lenthall, E. Kyffin...Besselsleigh Manor, Abingdon
Lyon, William...Arlington Manor, Newbury
Mills, John...Pinkneys Green, Maidenhead
†Monck, J. Bligh...Coley Park, Reading
Moore, E. Wells...Coleshill, Faringdon
Morland, George B....Abingdon
Morley, E....Brize Norton, Bampton, Faringdon
†Morrison, Charles...Basildon Park, Reading
Morshead, Sir W., Bart....Forest Lodge, Binfield
†Mount, W. G....Wasing Place, Reading
Nalder, Thomas...Challow, Wantage
†Newman, H....Friar's Court, Clanfield, Faringdon
†Owen, Frederick J....Barton Grove, Hungerford
†Pusey, S. E. B. B....Pusey House, Faringdon
Russell, Sir C., Bart....Swallowfield, Reading
Sawyer, Charles...Heywood Lodge, Maidenhead
Say, R. Hall...Oakley Court, Windsor
†Shuter, James...Crookham, Newbury
†Stevens, Rev. T....Bradfield Rectory, Reading
†Sutton, M. Hope...Cintra Lodge, Reading
Tait, Henry...Shaw Farm, Windsor
Thoyts, M. G....Sulhamstead House, Reading
†Thoyts, Major...Sulhamstead House, Reading
†Throckmorton, Sir W., Bt....Buckland, Faringdon
Trumper, Jos., jun....Burnham Abbey, Maidenhead
†Tucker, Henry...Bourton House, Shrivenham
†Tull, Henry...Crookham, Newbury
†Tull, Richard...Crookham, Newbury
Turner, John...Englefield, Reading
†Twinch, John...Thames Street, Windsor
Valpy, R. H....Enborne Lodge, Newbury
Waldron, W. B....Poughley, Hungerford

Wallis, George...Old Shifford, Bampton, Faringdon
Walter, Captain E....Tangley, Wokingham
Warden, T. F....Easthampstead Park, Wokingham
Wasborough, W. D....Stockham, Wantage
Waters, E. F. A.....Hollington, East Woodhay, Newbury
Wheble, J. J....Bulmerhoe Court, Reading
Wilkins, Edmund...Mortimer, Reading
†Williams, G....Buckland, Faringdon
†Williams, James...Shippon, Abingdon
†Winterbottom, J. E....East Woodhay, Newbury
†Wright, G. T....Stoke Farm, Wokingham

BUCKINGHAMSHIRE.

Governors.

Blount, William...Orchill, Gerrard's Cross
Carington, Lord...Wycombe Abbey
†Chesham, Lord....Latimer, Chesham
†Coleman, Edward J...Stoke Park, Slough
Murray, Charles Robert Scott...Danesfield, Marlow

Members.

†Botham, George...Wexham Court, Slough
Bramley-Moore, J....Haughley, Gerrard's Cross
†Buckingham, Duke of...Wootten, Aylesbury
†Cantrell, Charles Seward...Riding Court, Datchet
†Cantrell, Henry...Bayliss Court, Slough
Carson, Captain J. S....Spinfield, Great Marlow
Denchfield, J....Burston, Aston Abbotts, Aylesbury
†Dent, Edward, Fernacres, Fulmer, Slough
Disraeli, Right Hon. B., M.P....Hughendon Manor
†Drake, Thomas T....Shardloes, Amersham
Duncan, W. G....Bradwell House, Stony Stratford
†Duncombe, Sir P. P., Bt..Brickhill Manor, Bletchley
Du Pré, C. G....Wilton Park, Beaconsfield
Eaton, John...Beaconsfield
Elliman, James, Wellington Villa, Slough
Eve, Frederick...Sherrington, Newport Pagnell
Fitzroy, George...Grafton Regis, Stony Stratford
†Fountaine, Bernard T....Stoke House, Bletchley
Fowler, J. Kersley...Aylesbury
Fowler, Richard...Broughton Farm, Aylesbury
Gaskell, Major W. P....Fulmer House, Slough
Gilbey, Alfred...Wooburn House, Beaconsfield
†Guy, John Henry...Whitchurch, Aylesbury
†Harrison, R....Wolverton, Stony Stratford
†Harter, Rev. G. G....Cranfield, Newport Pagnell
Harvey, Sir R., Bart., M.P....Langley Park, Slough
†Hubbard, Egerton...Addington Manor, Winslow
Hunt, Frederick, Harmondsworth, Slough
Islip, F. W....Binford Farm, Great Marlow
Ive, John G....Langley, Slough
†Jegon, Trew...Slough
Kirbell, Edward...Latimer, Chesham
Lepper, G. A....Aylesbury
†Lilley, W. S....Hardmead Manor, Newport Pagnell
Major-Lucas, Edwin...Rowsham, Aylesbury
Morley, John...Wilton Farm, Beaconsfield
Morris, T. W....Bedgrove, Aylesbury
Nash, H. F....Upton Lea, Slough
Nash, John...The Rectory, Langley, Slough
†Newman, John...Brands House, High Wycombe
Newton, Alfred...Coleshill, Amersham
Norris, James...Castle Hill, Bletchingley
Paxton, Robert...Lower Winchendon, Aylesbury
†Piggott, G. Grenville...Doddershall, Winslow
Pike, William...Castlethorp, Stony Stratford
Pullin, Stephen...Mildridge Farm, Horton, Slough
†Roads, John...Addington, Winslow
†Robarts, A. J....Lillingstone Dayrell
†Robinson, J....Clifton Pastures, Newport Pagnell
†Rowland, Richard...Creslow, Aylesbury
†Rowland, W. Rickford...Creslow, Aylesbury
Senior, Trevor L....Broughton House, Aylesbury
Shakeshaft, Thomas...Ravenstone, Olney
Simpson, John...Potterspury, Stony Stratford
Thorpe, Henry...Buckingham
Treadwell, John...Upper Winchendon, Aylesbury
†Tyringham, W. B....Tyringham, Newport Pagnell
†Tyrrell, Avery...Bukin Manor, Horton, Slough
†Verney, Sir H., Bt....Clayden House, Winslow
†Way, Lewis Albert...Alderbourne, Gerrard's Cross
Whiting, J. Evans...Castle Thorp, Stony Stratford
†Whiting, J. Evans....Stoke Goldington, Newport Pagnell
†Whitworth, J. R....Weston Underwood, Newport Pagnell

CAMBRIDGESHIRE.

Members.

†Ambrose, Cole...Stuntney, Ely
†Ambrose, W. C....Quy, Cambridge
Armstrong, Samuel...Shingay, Royston
†Aveling, James T....Eldernell, Whittlesey
†Babington, Professor C. C....Cambridge
Banyard, T., jun....Poplar Hall, Horningsea
Bidwell, Charles...New Barnes, Ely
Briggs, Thomas...Babraham, Cambridge
Brown, John...Elwyn Orchard, March
Bultitaft, H....Bedwellhay Grange, Ely
Burroughes, Rev. T....Gazeley, Newmarket
Catling, Captain R. C....Needham Hall, Wisbech
Cooke, Grimwood...Horseheath Park Farm, Linton
Cooke, Mason...The Lawns, Ely
†Cutlack, Henry...Ely
†Cutlack, John, jun....Littleport, Ely
†Cutlack, Joseph...Ely
Derry, Charles M....Gedney, Wisbech
†Egar, Samuel...Wyrde, Thorney
Ellis, Charles...Meldreth, Royston
Ellis, Frederick...Chesterton, Cambridge
†Emson, H. H....Nether Hall, Cherry Hinton
Evans, Frederick...Sawston
†Fison, J. P....Teversham, Cambridge
†Fison, Samuel...Horningsea, Cambridge
Francis, Clement...Quy Hall
Frost, Captain H....West Wratting Hall, Linton
Fyson, Edward...Silverley, Ashley, Newmarket
Gardner, W. S....French Hall, Moulton, Newmarket

Giddons, Wm....Walpole St. Peter, Wisbech
Gosling, James W..Little Bradley Place, Newmarket
Grain, A. T....2, St. Andrew's Hill, Cambridge
Grain, Peter...Shelford, Cambridge
Greene, John M....Stradishall, Newmarket
Gunnell, Thomas...Milton, Cambridge
†Hamond, W. Parker...Pampisford Hall, Cambridge
†Hardwicke, Lord...Wimpole
Holben, R. Rowley...Barton, Cambridge
†Houblon, R. Archer...Bartlow, Cambridge
Huddleston, F....Sawston Hall, Cambridge
Humphrey, A....Walpole St. Peter, Wisbech
Hurrell, Henry...Madingley, Cambridge
Hurrell, William....Newton, Cambridge
†Ivatt, Charles E....Rampton, Cambridge
Jary, R. M...Underwood Hall, Westley, Newmarket
Jennings, Thomas...Phantom House, Newmarket
Johnson, B. B....Withersfield, Newmarket
†Johnson, Thomas...Whittlesea
Johnson, William...Walpole St. Peter, Wisbech
Jonas, John Carter...3, St. Mary Street, Cambridge
Jones, Henry..Apeshall House, Littleport, Cambridge
Lambert, Henry...Great Abington, Cambridge
†Linton, John...Westwick Hall, Cambridge
†Little, H. J....Coldham Hall, Wisbech
Little, James L....The Plains, Littleport, Ely
†Little, W....Littleport, Ely
Little, W. Cutlack...Stag's Holt, March
†Long, Hanslip...Shippen Hall, Ely
†Loomes, Edward...Whittlesea
Luddington, J. L....Littleport, Ely
Martin, G. H....Little Downham, Ely
†Martin, Henry W....Littleport, Isle of Ely
†Martin, Joseph...Littleport, Isle of Ely
Maynard, Robert...Whittlesford, Cambridge
Moore, William...Elm House, Elm, Wisbech
Mott, William...Littleport, Isle of Ely
†Pate, Martin...Ely
†Phypers, A....Long Stanton, Cambridge
†Raincock, H. D....Waltons, Ashdon, Linton
Ratliff, W....Newmarket
Roads, Charles...Meldreth, Royston
Roads, John....Foxton Bury, Royston
Robins, G. F....Isleham, Soham
Rowton, William...Cambridge
Russell, G. E...Walpole St. Peter, Wisbech
Rush, Thomas...Babraham, Cambridge
†Slack, Alfred...Soham, Ely
Slater, S. Webb...Cheveley Hall, Newmarket
Staffurth, W. A. Ellis...Whittlesea
Stephenson, Robert...Burwell, Cambridge
Towgood, Hamer...Little Shelford
†Vipan, T. Maylin...Sutton, Ely
Wallis, Serjeant...Granchester, Cambridge
Watson, Frederick...Lynwood, March
Webb, H....Streetly Hall, West Wickham, Linton
Webb, Samuel...Babraham, Cambridge
Webb, Thomas...Hildersham, Cambridge
†Woodham, W. Nash...Shepreth, Melbourne
Wright, Charles...Streatham, Ely
Yorke, Hon. Eliot T....Wimpole, Arrington
Yorke, James N....Newmarket

CHESHIRE.

Governors.

†Davies, David Reynolds..Agden Hall, Lymm
Legh, W. John, M.P....Lyme Park, Disley, Stockport
Westminster, Duke of, K.G...Eaton Hall, Chester

Members.

Armstrong, J. Knight...Wharton Hall, Winsford
Baker, William...Highfields, Audlem
†Balstone, Henry K....Hale Carr, Altrincham
†Barbour, George...Kingslee, Farndon, Chester
†Barbour, R....Bolesworth Castle, Chester
Barker, Thomas...Bramall Grange, Stockport
Barton, Richard...Caldy Manor, Birkenhead
Beckett, Richard...Hartford, Northwich
Beckett, Samuel...Eccleston, Chester
Bell, Henry...Hempshaw Brook Brewery, Stockport
Bentley, Timothy...Davenham, Northwich
Billington, John S....Balterley Hall, Crewe
Birchall, Edward...Willastone, Nantwich
Bourne, John...Hankelow House, Nantwich
Bowers, Henry R....Abbotts Lodge, Chester
Brady, Charles Alldis...Adswood, Stockport
Brady, W. Hollinshed...Chestergate, Stockport
Broughton, E. Delves...Wistaston Hall, Nantwich
Burgess, B....Weaverham, Northwich
Byrd, David...Spurston Hall, Tarporley
Callender, Peter...Devonshire House, Birkenhead
Campbell, C. Lee...Thurstaston Hall, Birkenhead
†Carter, George John...Tatton Dale, Knutsford
†Case, J. B....Poulton Hey, Bebbington, Birkenhead
Cattle, John, jun....Marsh Farm, Sealand, Chester
Cawley, Thomas...Nantwich
Chadwick, Thomas...Wilmslow Grange
Cholmondely, Col. Hon. G...Abbots Moss, Northwich
†Cholmondeley, Marquis of...Cholmondeley Castle, Nantwich
†Churton, John...Foregate Street, Chester
Cliffe, Thomas...Crewe Gates, Crewe
†Combermere, Viscount...Combermere, Nantwich
Cooke, John...Mill Moor, Macefen, Malpas
Dale, John...Chelford, Crewe
Danson, J. T... Green Fields, Little Sutton, Chester
Davenport, John...Bollington, Altrincham
Davenport, W. Bromley...Capesthorne, Congleton
Davies, C. B....Eardwick Hall, Middlewich
†Davies, James...Bollington, Altrincham
Dean, James...Betley, Crewe
Dickson, Arthur...Queen's Park, Chester
†Dickson, G. A....Newton Nurseries, Chester
Dixon, Captain G....Astle Hall, Chelford, Crewe
Dobell, Joseph...Leftwich, Northwich
Egerton, Hon. Wilbraham, M.P...Rostherne Manor, Knutsford
Egerton, Lord...Tatton Park, Knutsford
Egerton, Sir P. de Malpas G., Bt., M.P...Oulton Park, Tarporley
Fair, James...Tabley Villa Farm, Knutsford
†Fair, William...Aston by Budworth, Northwich
Fitton, Samuel...Willastone, Nantwich

Foden, Edwin...Sandbach
France-Hayhurst, Colonel...Bostock Hall, Middlewich
†Frost, Robert...Lime Grove, Chester
Gardner, W. A...Hough Green, Chester
Glegg, Lieut.-Col. E. Holt...Backford Hall, Chester
Goodwin, J. A....Henhull Farm, Nantwich
Goose, Daniel, jun....Kinnerton, Chester
Gouldburn, John...Broomhall, Nantwich
Graham, Alexander...Barnston, Birkenhead
Greenwood, William...Dunham Massey, Altrincham
Grey, Edward...Eastham, Birkenhead
Griffith, E. W....Tiersford, Tarporley
Griffiths, R. C....Broughton, Chester
Gruning, Louis....Broomborough, Chester
Hague, James...Gawsworth, Macclesfield
Hardon, Edwin...Heaton Norris, Stockport
Hardwick, R....Bowden, Altrincham
Harkes, David...Mere, Knutsford
Harrison, John...Warmingham, Sandbach
Harrison, T. Ashton...Stalybridge
Hayes, John Higson...Frodsham
Heath, Thomas...Withymore Farm, Burleydam
Heywood, W. H ...Dunham Massey, Altrincham
†Hobson, Thomas...Pownall Hall, Wilmslow
Hoggins, T....Trafford Lodge, Chester
Holland, R...Norton Hall Runcorn
Holland, William...Broxton, Chester
Hornby, W. H....Shrewbridge Hall, Nantwich
Howard, Samuel...Dunham Massey, Altrincham
Hurst, Thomas...Tabley, Knutsford
Jackson, George...Higher Peover, Knutsford
Jackson, T. F....Tattenhall Hall, Chester
Jackson, W. Turner...Noctorum, Birkenhead
†Jocelyn-Ffoulkes, Major..11, Stanley Place, Chester
Johnson, Thomas...Hermitage, Frodsham
Jones, James...The Oaklands, Spurston, Tarporley
Jones, Thomas...Kiln Green, Malpas
†Kennard, Adam S....Dawpool, Birkenhead
Kirby, Thomas...Elton Cottage, Sandbach
Latham, G. W....Bradwall Hall, Sandbach
Leather, Simeon...Delamere, Northwich
Lees, William...Gorsty Hill, Crewe
Legh, G. Cornwall...High Legh Hall, Knutsford
†Leigh, Colonel Egerton, M.P...The West Hall, High Leigh, Knutsford
Littler, J. Brotherton...29, Edgmond St., Seacombe
Lockwood, A. Carden...Chester
Lowe, John...Wheelock Heath, Sandbach
Lowe, Thomas...Calverley Hall, Handley, Chester
Macdona, Rev. J. Cumming...Cheadle
Macgregor, John...Acton, Weaverham, Northwich
McHattie, John...Chester
Madders, Wm....Stapley Villa, Nantwich
Mousley, George.. Hooton Hall, Chester
Myott, James...Capesthorne, Crewe
†Naylor, R. C....Hooton Hall, Chester
Newhouse, Henry...Tatton Park, Knutsford
Newhouse, Richard...Bowdon
Newton, Martin...Oldfield, Altrincham
Newton, T. H....Oldfield, Altrincham
Noden, Joseph...Bridgmere Hall, Nantwich
Nunnerley, John.. Buerton Hall, Nantwich
Oswell, E. F....Hampton Hall, Malpas
Parker, Thomas...Aldford, Chester
Parrott, T....Green Bank, Sutton, Macclesfield
Pickering, J....Pool Hall, Sutton, Chester
Potts, Charles William...Heron Bridge, Chester
Rayner, Henry...Liverpool Road, Chester
Rigby, Thomas...Darnhall Mill Farm, Winsford
Roberts, John...Well House, Saltney, Chester
Roberts, Robert...The Firs, Chester
Sandbach, S. H....Handly, Chester
Scragg, Thomas...Calverley, Tarporley
Shepherd, William...Eaton, Chester
Shuker, William...Calverley, Tarporley
Siddeley, John...Spring Bank, Altrincham
Siddorn, Henry...Rushton, Tarporley
Skidmore, James Stephen...Nantwich
Slater, Cyrus...Dunkirk, Holmes Chapel
Smith, Thomas...Mollington Farm, Chester
†Snow, T. Owen...Lack Hall, Chester
Speakman, Thomas...Doddington Park, Nantwich
Starkey, Major...Wrenbury Hall, Nantwich
Statter, John...New Brighton, Chester
†Sykes, E. H....Edgeley, Stockport
Tabley, Lord de...Tabley House, Knutsford
Thompson, E. J....Timperley, Altrincham
Thompson, Henry...Organsdale, Kelsall, Chester
†Tollemache, John...Tilston Lodge, Tarporley
Tonge, James C....New Hall, Neston
†Torr, John, M.P...Carlett Park, Eastham, Chester
Townshend, Charles...Chester
Twemlow, Thomas T....Betley Court, Crewe
Vernon, William...Tarporley
Walker, Joseph...Chorlton, Nantwich
Walley, John...Mere House, Baddiley, Nantwich
Wallworth, Joseph...White Hall, Wilmslow
Walsh, Zaccheus...The Park, Wilmslow
Warburton, Rowland E. E...Arley Hall, Northwich
†Watterson, W. C....Bowdon, Altrincham
Whittingham, John...The Cross, Nantwich
Wilbraham, Randle...Rode Hall, Lawton
Williams, J. R....Harewood Hall, Kelsall, Chester
†Williams, William...Blacon House, Chester
Wilson, William...Cholmondeley, Nantwich
Wright, James...Cop House Farm, Saltney, Chester

CORNWALL.

Governor.

Robartes, Lord...Lanhydrock House, Bodmin

Members.

Anderton, E. D....Oakroyd, Falmouth
†Barton, Rev. H. N....St. Ervan Rectory, Padstow
Bishop, James...Bobcarn, Looe
†Bolitho, Edward...Trewiden, Penzance
†Bolitho, T. S....Pendleverne, Penzance
†Bolitho, William...Penzance
Brenton, William...Polbathic, St. Germans
Clark, William...Luney Barton, St. Ewe
Clemow, John F....St. Merryn, Padstow

Coryton, Augustus...Pentillie Castle, Saltash
†Daubuz, John Claude...Killiow, Truro
†Davey, J. S....Bochym House, Helstone
Davey, Richard...Bochym House, Helstone
Fortescue, Hon. G....Boconnock, Lostwithiel
Glanville, Reginald C....Sconnor, St. Germans
Grose, Wesley R....Penpont, Wadebridge
Hoblyn, W. P....The Fir Hill, St. Columb Minor
Hockin, John...Broomhill, Stratton
Hosken, Samuel...Loggan Mill, Hayle
†Lobb, George, jun....Lawhitton, Launceston
†Marshall, Rev. E. H....The Rectory, Launceston
Olver, R. Sobey...Trescowe, Bodmin
Rashleigh, J....Menabilly, Par Station
†Rodd, F....Trebartha Hall, Launceston
†Rogers, John J....Penrose, Helstone
Rosewarne, John...Nanpusker, Hayle
Stephens, Rev. F. T....St. Mawgan
Stephens, W. W. Sesley.Hendra, St. Kew, Wadebridge
Thynne, Rev. A. C....Penstowe, Stratton
Tremain, James...Polsue, Grampound
†Tremayne, John, M.P....Heligan, St. Austle
Trethewy, W....Tregoose, Probus
†Tyacke, John...Merthen, Falmouth
Venning, John...Treblethick, St. Mabyn, Bodmin
†Vivian, A. Pendarves, M.P..St. Anthony, Grampound
Vivian, J. A....Penbole, St. Kew, Wadebridge
Vivian, Lord...Glynn, Bodmin
Whitley, Nicholas...Truro
†Williams, Sir F. M., Bt., M.P..Goonvrea, Perranarworthal
Williams, Henry...Alma, Truro
†Willyames, E. B. ...Nanskeval, St. Columb

CUMBERLAND.

Governors.

†Lonsdale, Earl of...Lowther Castle, Penrith
†Marshall, William...Rattendale Hall, Penrith

Members.

Alexander, W. L....Oak Hill, Luton, Cockermouth
Allison, Robert A....Scaleby Hall, Carlisle
†Atkinson, James...Winderwath, Penrith
Barton, Thomas...The Crescent, Carlisle
†Bell, John...Scale Hall, Lazonby, Penrith
†Bell, Robert...Mallsgate, Brampton
†Boustead, John...Armathwaite, Cockermouth
Birkett, Joseph...Foxton House, Penrith
Blackstock, John...Hayton Castle, Maryport
Borthwick, William...Monkwray, Whitehaven
Bowstead, James Cooper...Hackthorpe Hall, Penrith
†Bowstead, Thomas...Eden Hall, Penrith
†Bridson, Joseph R....Belle Isle, Windermere
†Briscoe, Sir Robert, Bart....Crofton Hall, Wigton
Brown, Matthew...Scarbank, Longtown
†Caddy, Henry...Rougholm, Bootle
†Carruthers, R. B....Guards Mill, Gretna
Cousins, Richard...Whitehaven
Cumpston, Joseph H....Barton Hall, Penrith
†Dacre, Rev. William...Irthington Vicarage, Carlisle
Dalton, Pattinson...Cummersdale, Carlisle
Dalzell, Anthony...Stainburn Hall, Workington
Dalzell, John...Papcastle, Cockermouth
†Dees, James...Flora Ville, Whitehaven
†Dent, Wilkinson.Flass House, Kirkby Thore, Penrith
Donald, J. H....Green Gill, Penrith
Fawcett, James...Scaleby Castle, Carlisle
Fenton, John...Frenchfield, Penrith
†Fisher, Captain C....Distington House, Whitehaven
†Fisher, Peter...Distington Hall, Whitehaven
†Fletcher, Capt. Joseph...Lowther St., Whitehaven
Foster, John P....Kilhow, Mealsgate, Carlisle
†Foster, William...Westward Park, Wigton
†Fox, William...Abbey, St. Bees
Fraser, Henry Newby...Hayclose, Penrith
Gibbons, Thomas...Burnfoot, Longtown
Graham, James...Parcelstown, Longtown
†Grainger, Francis...Fir Tree Bank, Abbey Town
Gunson, John..Ponsonby, Calder Bridge, Whitehaven
Hayton, Pattinson...Lonsdale Street, Carlisle
†Heskett, John...Plumpton Hall, Penrith
Heskett, William...Plumpton Hall, Penrith
Hetherington, R. B....Park Head, Silloth
Highfield, George...Blencogo House, Wigton
Hodgson, W. N., M.P....Newby Grange, Carlisle
Hogarth, John...Julian Bower, Penrith
†Hope, Joseph...Whoof House, Carlisle
Howard, Hon. C. W. G., M.P....Naworth Castle Brampton
†Howard, Henry C....Greystoke Castle, Penrith
Hutchinson, John...Brougham Castle, Penrith
†Jackson, William...Oak Bank, Carlisle
†James, Captain W. E....Barrock Lodge, Carlisle
†Jefferson, Robert...Preston Hows, Whitehaven
Jefferson, Skelton...Preston Hows, Whitehaven
Jenkinson, Wilson...The Schoose Farm, Workington
Lawson, Sir Wilfrid, Bt., M.P..Arkleby Hall, Aspatria
†Lawson, W....West Street, Wigton, Carlisle
†Little, James...Fauld, Longtown
Moffat, James...Kirklinton Park, Carlisle
Mounsey, W. R....Lowther, Penrith
Musgrave, John...Wasdale Hall, Holm Rook
†Musgrave, Sir R. C., Bart....Edenhall, Penrith
†Nicholson, James...Blencairn Hall, Penrith
Norman, William...Hall Bank, Aspatria
Oliphant-Ferguson, G. H. H..Broadfield House, Carlisle
†Parker, T. Holme...Warwick Hall, Carlisle
†Parker, William...Carlton Hill, Penrith
Peppin, George...Castle Grove, Bampton
†Postlethwaite, J....The Hollins, Whitehaven
Railton, Henry...Snittlegarth, Wigton
†Rawlinson, R....Sella Park, Whitehaven
†Richardson, John...The Oaks, Dalston, Carlisle
Rigg, Lieut.-Col. H....Crossrigg Hall, Penrith
Robertson, J....33, Queen Street, Whitehaven
Ross, John...The Grove, Ravensglass
†Salkeld, Thomas...Holme Hill, Carlisle
Sanderson, Lieut.-Col....Eden Lacey, Penrith
†Saunders, C. R....Nunwick Hall, Penrith
Scott, Jonathan...Little Crosthwaite, Keswick
Sharp, Granville...Cardew Lodge, Carlisle
Smith, George...Fitz Farm, Aspatria

†Smith, George...The Luham, Penrith
†Spedding, John J....Greta Bank, Keswick
†Stanley, William...Ponsonby Hall, Whitehaven
Sweeten, B. T....Ashgrove, Penrith
†Taylor, John...Burnfoot House, Wigton
†Thompson, Anthony...Cross, Whitehaven
†Thompson, Robert...Inglewood Bank, Penrith
Thompson, Thomas C....Milton Hall, Brampton
Tinkler, Robert...Penrith
†Todd, John...Mireside, Wigton
Toppin, J. C....Musgrave Hall, Penrith
Towerson, John...Whitehaven
Vane, Sir H. R., Bart....Hutton Hall, Penrith
†Varty, Thomas...Stag Stones, Penrith
Waugh, Edward...Cockermouth
White, G. R....Belle House, Whitehaven.
Wilson, John...Fairfield, Lorton, Cockermouth
Wilson, Joseph...Penrith
†Winn, W. Fothergill...Bower Bank, Penrith
†Wood, George...Wetherall, Carlisle

DERBYSHIRE.

Governors.

†Belper, Lord...Kingston Hall, Derby
Evans, Thomas William, M.P...Allestree Hall, Derby
†Heywood, Sir T. Percival, Bt...Doveleys, Ashbourne
†Vernon, Lord...Sudbury Hall, Derby

Members.

Abell, John...Middleton Park, Sudbury, Derby
Arkwright, Francis, M.P....Overton Hall, Ashover, Derby
Arkwright, Frederic C...Wellersley, Cromford, Derby
Bagshawe, F. W....Wormhill Hall, Buxton
Bakewell, Charles Henry...Quorndon, Derby
Blackwall, J. B. Evans...Idridgehay, Derby
†Bland, Henry Wainwright...Barlow, Chesterfield
†Boden, Henry...The Friary, Derby
†Boden, Walter...Gower Street, Derby
Bott, Richard...Church Broughton, Derby
Bradshaw, Francis, jun....Barton Blount, Derby
Brownson, John..Hollyhurst, Marston Montgomery, Ashbourne
Campbell, Colin M., M.P....Woodseat, Ashbourne
Carillon, John Wilson...Wormhill, Buxton
†Carrington, T. S. T....Eaton, Doveridge, Derby
Chawner, Richard...Hare Hill, Sudbury, Derby
Clark, William...Burneston, Derby
†Coke, Hon. E. K...Longford Hall, Derby
Coleman, John...Park Nook, Quorndon, Derby
Colvile, C. R....Lullington Hall (Burton-on-Trent)
Cooke, Henry...Edgemoor, Buxton
Copestake, T. G....Brailsford, Derby
Cottingham, John G....Chatsworth, Chesterfield
Cox, Samuel Walker...Spondon Cottage, Derby
Cox, Walter H....Woodside, Bolsover, Chesterfield
Cox, William...Brailsford, Derby
Cox, William Thomas...Spondon Hall, Derby
Crawshaw, R. W....The Hagge, Chesterfield
Crewe, Sir J. H., Bart....Calke Abbey, Derby
Crompton, George...Chesterfield
Crompton, John George...Derby
†Curzon, N. C....Etwall Hall, Derby
Denman, Lord...Middleton Hall, Bakewell
De Rodes, W. H....Barlborough Hall, Chesterfield
†Dixon, George M....Bradley Hall, Ashbourne
†Drewry, Frank...Sudbury, Derby
Etches, Edward...Derby
†Feilden, Robert...Coxbench, Derby
Fox, Frederick F....Melbourne, Derby
Frank, Robert H....Ashbourne Hall, Ashbourne
†Gardom, T. W....The Yeld, Baslow, Chesterfield
Greaves, William...Bakewell
Grimes, H. W....Scarcliffe Grange, Chesterfield
Hall, Lorenzo K....Holly Bush, Sudbury, Derby
Hardy, Arthur...Mackley House, Sudbury
Harris, John...Cromford Bridge House, Matlock
Harrison, John, jun....Snelston Hall, Ashbourne
Harrison, W. H....Church Mayfield, Ashbourne
Haywood, George...Derby
Haywood, James...Derby
Heywood, Arthur P....Duffield Bank, Derby
Hubbersty, A. C....The Ford, Alfreton
Hubbersty, Henry A....Buxton
Hubbersty, William P....Wirksworth
Hurt, Albert F....Alderwasley, Belper
Johnson, Robert...Kirkireton, Wirksworth
Jowett, Christopher...Palterton, Chesterfield
†Lea, John...Mackley Farm, Sudbury, Derby
Leacroft, Rev. C. H....Brackenfield, Alfreton
†Lucas, Bernard...Chesterfield
†Markham, C....Tapton House, Chesterfield
Meynell, F. W....Coxbench Hall, Derby
†Meynell, Godfrey...Meynell Langley, Derby
Morewood, Charles R. P....Alfreton Hall
Mundy, E. Miller...Shipley, Derby
Mundy, William...Markheaton, Derby
Murray, Gilbert...Elvaston Castle, Derby
Nesfield, R. M. N....Castle Hill, Bakewell
Newton, Charles E....Mickleover, Derby
Nuttall, James...Chaddesden, Derby
Oakes, T. H....Riddings House, Alfreton
Parkin, John...Idridgehay, Wirksworth
Pole, Reginald Chandos...Radbourn Hall, Derby
Pole-Gell, H. Chandos...Hopton Hall, Kirksworth
†Prince, John...Foston Hall Farm, Derby
Radford, Arthur...Etwall Lodge, Derby
Radford, C. C....Tansley Wood, Matlock
Radford, Vaughan H....Campfield Hall, Alfreton
†Renshaw, H. C....Chapel-en-le-Frith
Robson, S., jun....Melbourne
†Satterfield, Joshua...13, Full Street, Derby
Scarsdale, Lord...Kedleston Hall, Derby
†Shaw, John...Normanton House, Derby
Sitwell, R. S....Morley, Derby
Smith, F. N....Winfield Park, Ripley
Smith, Rowland...Duffield Hall, Derby
Strelly, R. C....Oakerthorpe, Alfreton
†Strutt, Hon. Arthur...Duffield, Derby
†Strutt, Hon. Frederick...Kingston, Derby
Taylor, Thomas...Hopton, Wirksworth
Thomson, John...King's Newton, Derby

†Thornhill, W. Pole...Stanton Hall, Bakewell
Tomlinson, Arthur...Stenson House, Derby
†Turbutt, Wm. G....Ogston Hall, Alfreton
Walker, Matthew...Chaddesden, Derby
Walthall, Henry W....Alton Manor, Derby
Webster, G. P....Oxcroft, Bolsover, Chesterfield
Woolley, Joseph...Allestree, Derby
Wright, Frank...Hill Top Farm, Ashbourne
Wright, John...Osmaston Manor, Derby

DEVONSHIRE.

Governors.

Acland, Sir T. Dyke, Bt., M.P...Sprydoncote, Exeter
†Fortescue, Earl...Castle Hill, South Molton
Saint Germans, Earl of...Port Eliot, Devonport

Members.

Acland, C. T. Dyke...Sprydoncote, Exeter
Arnold, George...Dolton
†Baillie, Evan...Filleigh, Chudleigh
†Baker, Robert N. G....Heavitree, Exeter
Bayly, John...Plymouth
†Beedle, Thomas...Southwood, Tiverton
Bell, J. Askew...East Budleigh, Salterton
Bennett, E. Gasking...Plymouth
Benson, John...Uplands, Exeter
Besley, Henry...South Street, Exeter
Boger, Deeble...Wolsdon, Devonport
†Boger, Hext...Lower Durnford Street, Stonehouse
Brown, George...Roborough House, Barnstaple
†Bulteel, John...Pamflete, Ivybridge
Burnard, Charles F....Compton Villa, Plymouth
†Carew, Thomas...Collipriest House, Tiverton
†Carew, W. H. Pole...Antony House, Devonport
†Carpenter-Garnier, J., M.P...S. Sydenham, Tavistock
Churchill, H....Barton House, Morchard Bishop
Cleave, Benjamin W....Newcombe House, Crediton
†Clinton, Lord...Heanton Satchville, Beaford
Collier, W. F....Woodtown, Horrabridge
†Collins, John...Wonham, Bampton
Cornish, John F....Stancombe, Kingsbridge
Davie, Sir H. Ferguson, Bt., M.P....Creedy, Crediton
†Davy, J. Tanner...Barton Roseash, South Molton
†Devon, Earl of...Powderham Castle, Exeter
Diamond, James...The Beeches, Axminster
Divett, John...Bovey Tracey
Drew, James...Artiscombe, Tavistock
†Drewe, E. Simcoe...The Grange, Honiton
†Duckworth, Sir J., Bart....Wear House, Exeter
Durant, Richard...Sharpham, Totnes
Eccles, H. J....Hareston, Plympton
Elliott, Samuel...Trafalgar House, Plymouth
Elton, Sir E. M., Bart....Widworthy Court, Honiton
Exeter, The Bishop of...The Palace, Exeter
Fletcher, Charles E....Luscombe, Dawlish
Follet, Charles John...Exeter
Ford, Charles T....Stoke Canon, Exeter
Franklin, Joseph H....Huxham, Exeter
†Gamlen, W. H....Brampford Speke, Exeter
Garratt, John...Bishops Court, Exeter
Gordon, Charles...Wiscombe Park, Honiton
Gould, John...Poltimore, Exeter
Grainger, Rev. G. W... Luppitt Vicarage, Honiton
Greenslade, John...Bolham, Tiverton
Hamlyn, S. C....Leawood, Bridestowe
Hole, William...Winham, Cullompton
†Huyshe, Rev. John...Clysthydon, Collumpton
†Johnson, John G....Cross House, Torrington
†Karslake, Rev. W. H....Mesham, South Molton
†Kennaway, Sir John H., Bt., M.P....Escot, Ottery St. Mary
Kitson, William...Torquay
Lake, John...Edgeworthy, Morchard, Tiverton
Langdon, Mrs....Flitton Barton, North Molton
†Lopes, Sir Massey, Bt., M.P...Maristow, Roborough
†Marker, Richard...Combe, Honiton
†Martin, Gibson...Tavistock
†Miles, William...Dix's Field, Exeter
Milford, Frank...Haldon, Kenn, Exeter
Milford, Thomas...Thorverton, Cullompton
Morley, Earl of...Saltram, Plympton
Mount Edgecumbe, Earl of. Mt Edgecumbe, Devonport
Norman, G....Dinnaton, Swimbridge, Barnstaple
Norrington, Charles...Catte Down, Plymouth
Norris, Charles...Motion Barton, Exeter
†Northcote, Rt. Hon. Sir S. Bt., M.P..Pynes, Exeter
Osmond, Edwd., Woodrow..Brampford Speke, Exeter
Pennell, H. B....Dawlish
Phillips, Thomas...5, Princess Square, Plymouth
Pidgeon, Hubert H....Great Torrington
Porter, William...Hembury Fort, Honiton
†Portsmouth, Earl of...Eggesford House
Potter, T., jun....Thorverton, Cullompton
Prideaux, Sir E. S., Bart....Netherton, Honiton
†Proby, Rev. W. H. B....Colyton House, Axminster
Quartly, John...Champson Molland, South Molton
†Radcliffe, C. Lopes...Derriford, Tamerton Foliott
Radmore, G....Court Barton, Thorverton
Riddell, Major-General...Oaklands, Chudleigh
Ridgway, Lieut.-Col. A....Blackanton, Totnes
Sanders, F. A....Stoke House, Exeter
†Sanders, F. W. A....Pilton, Pinhoe, Exeter
Scarborough, E. I....Colyford, Colyton
†Scratton, D. R....Ogwell, Newton Abbott
Shepheard, Joseph...Torpoint, Devonport
Smith, William...Whimple, Exeter
Spearing, John B....Maristow Cottage, Roborough
†Stevens, J. C. Moore...Winscott, Torrington
Stokes, Sidney W....Cowick Barton, Exeter
†Stowey, Augustus...Kenbury House, Exeter
†Strode, Major..Newnham Park, Plympton St. Mary
†Tanner, J. M....King's Nympton Park, Chumleigh
Tanton, E....Hill Farm, Torrington
†Troyte, C. A. W....Huntsham Court, Bampton
Turner, George...Brampford Speke, Exeter
Turner, James T....Thorverton, Cullompton
†Walrond, J. Walrond...Broadfield, Cullompton
Walrond, Captain W. H....New Court, Topsham
Ward, Samuel...St. David's, Exeter
Watson, R. H....North Gate, Totnes
†Webber, Charles H...Buckland, Barnstaple
†West, R. Thornton...Streatham Hall, Exeter

Wills, John...Pengellys, Exeter
Wippell, Henry...Alphington, Exeter
Wroth, Edward...Bigbury Court, Ivybridge
†Wyndham, J. Evelyn...Exmouth

DORSETSHIRE.

Governors.

Ilchester, Earl of...Melbury, Dorchester
†Portman, Viscount...Bryanston House, Blandford

Members.

Alington, Lord...Crichel, Wimborne
†Baker, Sir E. Baker, Bt...Ranston House, Blandford
Beauchamp, Granville P....St. Giles, Cranbourne
Benjafield, N....Motcombe, Shaftesbury
Bennett, Stephen White...Wareham
Bingham, Col. R. H..Bingham's Melcombe, Dorchester
Bridge, Thomas...Wynford Eagle, Dorchester
Buckman, Professor...Bradford Abbas, Sherborne
†Burt, H. C....Witchampton, Wimborne
†Calcraft, J. H....Kempstone, Corfe Castle
Camm, Rev. J. B. M....Monkton Wyld, Charmouth
Chick, John...Compton Vallence
Chick, Thomas...Stratton, Dorchester
Crane, James...Tolpuddle, Dorchester
Digby, G. D. Wingfield...Sherborne Castle
Digby, Lord...Minterne House, Dorchester
Dowden, Thomas...Roke Farm, Bere Regis
†Drax, J. S. W. Erle, M.P...Holnest House, Sherborne
†Eddison, Francis...Martinstown, Dorchester
†Evans, W. Herbert...Ford Abbey (Chard)
†Farrer, O. W....Binnegar Hall, Wareham
Filliter, Freeland...St. Martin's House, Wareham
†Floyer, John, M.P....Stafford, Dorchester
Fookes, Henry...Whitechurch Farm, Blandford
Ford, John...Rushton Farm, Blandford
Frampton, Henry...Okers Wood, Dorchester
Fry, Thomas...Baglake Farm, Dorchester
Fryer, W. Rolles...Lytchett Minster, Poole
Galpin, George...Tarrant Keynston, Blandford
Galpin, John...Dorchester
†Genge, Richard...Puddleton, Dorchester
†Goodden, John... Over Compton, Sherborne
Hambro, Charles, M.P....Milton Abbey, Blandford
Harding, James...Waterson, Dorchester
Homer, G. Wood...Athelhampton Hall, Dorchester
Homer, John G....Martinstown, Dorchester
James, J. W....Mappowder, Blandford
†Kennard, Rev. R. B....Marnhull, Blandford
Kindersley, E. Leigh...Clyffe, Dorchester
Lambert, W. C....Stepleton Manor, Dorchester
Legg, T. Fry...Burton Bradstock, Bridport
Legge, Benjamin...Litton Cheney, Dorchester
Luff, J. W....Canford, Wimborne
Mayo, Henry...Cokers Frome, Dorchester
†Medlycott, Sir W. C., Bt..Milborne Port, Sherborne
Morant, George...Hanbury, Wimborne
†Paget, Colonel...Park Homer, Wimborne Minster
Pitfield, A. J....Eype, Symondsbury, Bridport
Pitfield, John...Symondsbury, Bridport
†Portman, Hon. W. H. B., M.P....Bryanston, Blandford
Randall, R. G....Winfrith, Dorchester
Rodgett, Miles...Sandford, Wareham
Saunders, T. Chapman...Watercombe, Dorchester
Shaftesbury, Earl of, K.G....St. Giles's, Cranbourne
Sheridan, R. Brinsley...Frampton Court, Dorchester
Smith, J. Azariah...Bradford Peverell, Dorchester
Snow, Rev. G. D'Oyley...Langton Lodge, Blandford
†Thompson, William...Weymouth
Turnbull, Thomas John...Wimborne St. Giles's (Salisbury).
†Vavasour, Sir H. M., Bart....Beaminster
Weld, Edward J....Lulworth Castle, Wareham
†Williams, Robert...Bridehead, Dorchester

DURHAM.

Governors.

†Bowes, John...Streatham Castle, Staindrop
†Durham, Earl of...Lambton Castle, Durham

Members.

Apperley, Newton W...Rainton Gate, Fence Houses
Archer, Thomas, jun....Dunston, Gateshead
†Backhouse, Edmund, M P...Polam Hill, Darlington
Bell, Thomas...Hedley Hall, Marley Hill, Gateshead
Bainbridge, Robert S....Cleatham Hall, Staindrop
Blenkinsop, John...Simon Side House, South Shields
Bolam, Harry G....Keverstone, Staindrop
Boyd, E. Fenwick...Moor House, Durham
†Briggs, Captain C. J....Hylton Castle, Sunderland
Brodie, John...Braken House, Melsonby, Darlington
Brown, Ralph...Whickham, Gateshead
†Bryden, Robert...The Dene, Seaham, Durham
Burden, Rowland...Castle Eden, Stockton-on-Tees
Clark, Nathaniel...Beamish Park, Fence Houses
Cleasby, R. H....Broomside House, Durham
†Cochrane, A. H....Langton Grange, Darlington
Crawford, John...Lumley Park, Fence Houses
Darling, Robert...Plawsworth, Chester-le-Street
Dent, Ralph John...Streatham House, Darlington
Eade, Arthur...Aycliffe, Darlington
Easton, George...Horsley Hill, South Shields
†Easton, James...Nest House, Gateshead
†Eden, John....Beamish Park, Chester-le-Street
Eslington, Lord, M.P..Ravensworth Castle, Gateshead
Ettrick, Anthony...North Hylton, Sunderland
Fawcett, John...Durham
Forster, George E....Washington, Durham
Fowler, James...Park Hill House, Ferry Hill
Gillow, Rev. Charles...Ushaw College, Durham
†Greenwell, Thomas...Broomshields, Darlington
Gregory, John...Westoe, South Shields
Hall, Jonas...Low Field, Pierce Bridge, Darlington
Hawdon, W. W...Walkerfield, Staindrop, Durham
Headlam, Morley...Whorlton, Darlington
Henderson, John...Horsely Hall, South Shields
Heslop, Isaac...Urpeth, Chester-le-Street
Hunt, A. H....Birtley House, Chester-le-Street
Hunter, John J....Whickham Grange, Gateshead

Hutt, Right Hon. Sir W., K.C.B....Gibside Hall, Gateshead
Johnson, Lt.-Col. Edward...The Deanery, Chester-le-Street
Johnson, F. D....Aykleyheads, Durham
Kay, Richard...Forcett Valley, Darlington
Liddell, George, jun....Great Chilton, Ferry Hill
Maclaren, Henry...Offerton Hall, Sunderland
Maclaren, William...Herrington Hill, Sunderland
Maddison, Henry...The Lindens, Darlington
May, George...Harton Collieries, South Shields
Michell, John...Forcett Park, Darlington
Milbank, A. Sussex...Barningham, Barnard Castle
Monks, James...Aden Cottage, Durham
Moore, George...White Hall, Wigton
†Morgan, C. E....Flatts House, Bishop Auckland
Morgan, George...Cleves Cross, Ferry Hill
Morgan, M....North Bondgate, Bishop Auckland
†Ogden, John M....Sunderland
Ord, John R....Haughton Hall, Darlington
Parrington, H. M....Layton Sedgefield, Durham
†Pease, Edward...Greencroft West, Darlington
†Pease, J. W., M.P....Woodlands, Darlington
Quelch, J. Bewick...Bowburn House, Ferryhill
Ravensworth, Earl..Ravensworth Castle, Gateshead
Rawes, John G....22, New Street, Durham
Reay, Matthew...Heworth, Gateshead
Robinson, W. W....Southfield House, Sedgefield, Ferry Hill.
Rowlandson, Christopher ...The College, Durham
Rowlandson, Samuel...The College, Durham
†Rowlandson, S....Newton Morrell, Darlington
†Salvin, M. C....Burn Hall, Durham
Scarth, Leveson E....Staindrop, Darlington
Scarth, W. Thomas...Keverstone, Darlington
Scawin, Thomas...Durham
Smith, Henry...Eshe Hall, Durham
Stephenson, Robert...Brierton, Greatham, Durham
Steward, William...Lambton, Fence Houses
Stowell, W. Stow, jun....Darlington
Stratton, George...Spinnymoor House, Durham
Thompson, James...Bishop Auckland
Thompson, Rev. William...Eshe Land, Durham
Walker, R. C....Owton Manor House, Greetham, Stockton-on-Tees
Wall, G. Young, jun....New Exchange Buildings, Durham
Wallace, Henry...Trench Hall, Gateshead
Wharton, Rev. W. F....Barningham, Darlington
White, Thomas...22, Old Elvet, Durham
Whitwell, Thomas...Stockton-on-Tees
Wilkinson, P. S....Mount Oswald, Durham
Wilkinson, Robert...Little Chilton, Ferry Hill
Wilkinson, Rev. T. W....Crook, Darlington
Williamson, Rev. R. H....Hurworth, Darlington
Wilson, Charles...Shotley Park, Shotley Bridge
†Wilson, R. Bassett...Cliffe House, Darlington
†Wilson-Todd, W. H....Halnaby Hall, Croft, Darlington
†Wood, John...Harewood Hill, Darlington
Wooller, W. A....Sadberge Hall, Darlington

ESSEX.

Governor.

Courtauld, Samuel...Gosfield Hall, Halstead

Members.

†Abrey, T. Shaw Hellier...Witham
Allerton, Alexander R....Colemans, Prittlewell
Arden, George E....Dovercourt, Harwich
Badham, G. D....Bulmer (Sudbury)
Baker, John...Hockley, Rayleigh
†Barclay, W. Leatham...Knotts Green, Leyton
Baker-Wingfield, R....Orsett Hall, Romford
Barton, Philip, jun....Wakering Hall, Southend
Beadel, William James...Chelmsford
Bentall, E. H....Heybridge, Maldon
†Boghurst, William P....Frating Abbey, Colchester
Bott, Joseph Fennell...Morrell Roothing, Dunmow
Brampton, John...Ramsey, Harwich
†Braybrooke, Lord...Audley End, Saffron Walden
Bridge, Thomas...Buttsbury, Ingatestone
†Brise, Lieut. Col.S.B. R., M.P..Spains Hall, Braintree
†Burnell, Edward...Chappel, Halstead
Bury, Charles...Nazing
Butler, Edward...Ewell Hall, Kelvedon
Butler, Frank...Childerditch Hall, Brentwood
†Carey, Arthur...Rochford
Catchpool, Edward...Feering Bury, Kelvedon
Chaplin, J. R..Three Chimneys, Ridgewell, Halstead
Cheffins, Henry...Little Easton Manor, Dunmow
†Chetwode, A. L....Berners Hall, Ongar
Christy, James, jun....Boynton Hall, Chelmsford
Coleman, H. S....Chelmsford
†Colvin, B. B....Monkhams Hall, Waltham Abbey
Corder, Edward...Writtle, Chelmsford
†Cure, Capel...Blake Hall, Ongar
Davey, Charles M....Witham
Davey, H. M....Beverley Villas, Colchester
Duffield, James...Great Baddow, Chelmsford
Eddington, William...Chelmsford
Ellis, Samuel H....Maldon
Float, John Charles...Maldon
†Frankham, John...Little Canfield Hall, Chelmsford
†Fytche, Major-General A....Pyrgo Park, Havering, Romford.
Green, James John...Great Parndon, Harlow
†Gurdon, William...Brantahm, Manningtree
†Gurdon-Rebow, Hector J..Wyvenhoe Pk., Colchester
Hall, Collinson...Navestock, Romford
Hanbury, Osgood, jun....Howe Hatch, Brentwood
Hardy, James...Jaques Hall, Manningtree
Hart, George Canes...Harlow
Heathcote, R. Boothby...Friday Hill, Chingford
Hobbs, William...Derwards Hall, Bocking
Honywood, Mrs....Mark's Hall, Kelvedon
Hope, William...Parsloes, Barking
Hunt, Reuben...Earls Colne
Impey, William...Broomfield Hall, Chelmsford
Jillings, F. V....Clements Hall, Rochford
Jillings, John...Great Chesterford, Saffron Walden
†Jonas, F. M....Chrishall Grange, Saffron Walden
†Jonas, George...Ickleton, Saffron Walden

†Kemble, Thomas...Runwell Hall, Chelmsford
†King, George...Saffron Walden
King, John K....Coggeshall
†Lay, John Watson...Walcotts, Great Tey
†Lennard, Sir T. B., Bart....Belhus House, Avely
†Lowndes, G. A....Barrington Hall, Harlow
†McIntosh, D....Havering Park, Romford
Marriage, John...Moulsham Lodge, Chelmsford
Mashiter, Thomas...Priests, Romford
Masters, A. E..Nevendon Hall, Wickford, Chelmsford
Mechi, John J....Tiptree Hall, Kelvedon
Meeson, W. T....Doggetts, Rochford
†Meyer, Herman P. D....Little Laver Hall, Ongar
Moss, Benjamin...Ashington Hill, Rochford
Newcome, Samuel...White Crofts, Orsett
Page, W....Southminster, Maldon
†Papillon, P. O....Lexden, Colchester
Parsons, C....North Shoebury Hall, Rochford
Paxman, James...Bank Buildings, Colchester
Payne, Henry...Birdbrook, Halstead
†Perry-Watlington, J. W....Moor Hall, Harlow
Pertwee, James...Boreham, Chelmsford
Piggot, J. Algernon...Beckingham Hall, Witham
Prior, Arthur...Hylands Park, Chelmsford
Puckridge, A. F....Forest House, Chigwell
†Ray, Samuel...Great Yeldham, Halstead
Ridley, T. D....Chelmsford
Rist, Isaac...Brantham Hall, Manningtree
†Ross, James...Hatfield Broad Oak
†Rosslyn, Earl...Easton Lodge, Dunmow
Rust, W. H....Falconers Hall, Chelmsford
Sandle, William...Great Bardfield, Braintree
†Scragg, William...Great Clacton, Colchester
Sewell, Daniel...Beaumont Hall, Colchester
Shirley, T....Pond Cross Farm, Newport
†Smith, Sir C. Cunliffe W., Bart....Suttons, Romford
Smyth, James...Peasenhall, Yoxford
†Snell, John F....Witham House
South, John...Foulton Hall, Ramsey, Harwich
Spencer, Edward Stacey...Stanstead
Stable, R. Scott...George Lane, Woodford
Stane, J. Bramston...Forest Hall, Ongar
Stone, Henry R....Bedfords, Havering-atte-Bower
Sturgeon, C....South Ockendon Hall, Romford
Sworder, W....Tawney Hall, Romford
Symondson, G....Upshire Hall, Waltham Abbey
Tayler, Rowland...Colchester
Teverson, Henry...High Garrett, Braintree
†Thompson, W., jun....Thorpe-le-Soken, Colchester
Tomlinson, J. H....Shelley Hall, Ongar
†Townsend, Rev. C. G. G...Berwick Place, Hatfield Peverell, Chelmsford
†Turnbull, John G....Mellenden Lodge, Wanstead
†Vaizey, John R....Attwoods, Halstead
Vickerman, Charles R....Thoby Priory, Brentwood
†Wagstaff, T....Stifford, Romford
†Warren, Rev. J. C. B....Horkesley Hall, Colchester
Watts, G. J....Monkhams Hall, Waltham Abbey
Webb, Henry, jun....Abberton, Colchester
Webster, Charles...Waltham Abbey
Welch, Henry James...Bendysh Hall, Radwinton, Saffron Walden
†Western, T. Sutton...Felix Hall, Kelvedon
†Westhorpe, Rev. R. A....Blackmore Priory, Ingatestone
Whitlock, F...Lovingtons, Great Yeldham, Halstea
Whitlock, John...Great Yeldham Hall, Halstead
Windus, Edward Ernest...Passmores, Great Parndo Harlow.
Wood, George...Rochford
Woodward, F. Spencer...Great Saling, Braintree
Woodward, Henry...Stanway Hall, Colchester

GLOUCESTERSHIRE.

Governors.

†Barker, John Raymond...Fairford Park, Fairford
†Goldsmid, Sir F. H., Bt...Rendcomb Pk., Cirenceste
Hale, Robert Blagden...Alderley Park, Wotton
Hartley, W. H. H...Lye Grove, Cross Hands, Sodbur
†Holford, R. S., M.P....Weston Birt House, Tetbur
†Northwick, Lord...Moreton-in-the-Marsh
†Kingscote, Col., M.P....Kingscote, Wotton-unde Edge
†Moreton, Lord...Tortworth Court, Falfield

Members.

†Ackers, B. St. John...Prinknash Park, Painswick
Acock, Arthur...Cold Aston, Northleach
Agg, Colonel...Hewletts, Cheltenham
Anderson, Robert A....Cirencester
Arkell, Daniel...Dean Farm, Hatherop, Fairford
Arkell, H....Butlers Court, Boddington, Cheltenha
Arkell, Thomas...Boddington, Cheltenham
†Arkell, William...Hatherop, Fairford.
Avery, Thomas Charles...Gloucester
Badham, George...Wingmoor, Cheltenham
†Bailey, Henry...Cirencester
Baker, H. Orde Lloyd...Hardwicke Court, Gloucest
†Baker, T. Barwick L...Hardwicke Court, Gloucest
†Barton, Charles...Fifield, Lechlade
Bathurst, Earl...Ockley Park, Cirencester
Bazley, Thomas S....Hatherop, Fairford
†Beach, Sir M. E. H., Bart., M.P...Williamstrip Par Fairford
†Beak, George...Stanford Hall, Lechlade
Beaven, C...Ivy House Farm...Shipton Moyn Tetbury
Bengough, J. C....The Ridge, Wotton-under-Edg
Bennett, William...Goldwick Farm, Berkeley
†Blackwell, G., jun....Kingscote, Wotton-under-E
Bowly, Edward...Siddington House, Cirencester
Bowly, Wilfred...Siddington House, Cirencester
Bowly, William...Cirencester
Bravender, John...Cirencester
Browne, T. Beale...Salperton Park, Andoversfor
†Bubb, Anthony...Whitcombe Court, Gloucester
†Burnett, Francis...Kingscote, Wotton-under-Edg
†Cadle, Clement...Clarence Street, Gloucester
†Cadle, Thomas...Longcroft, Westbury-on-Sever
Campbell, R....Buscot Park, Lechlade
Capel, William...The Grove, Stroud
Castree, Josiah...College Green, Gloucester
Castree, Josiah, jun....College Green, Gloucester

†Chapman, Charles...Frocester Court, Stonehouse
Churton, E. W....Dodington, Chipping Sodbury
†Cole, Henry...Ashbrook, Cirencester
Constable, Rev. John...R. A. College, Cirencester
Cook, Thomas...Taddington, Winchcombe
Cooke, James Herbert...Berkeley Castle
Cornock, John...Burleigh Court, Dursley
†Coxe, James T....The Park, Cheltenham
Creese, William...Teddington, Tewkesbury
Croome, J. Capel...Bagendon House, Cirencester
†Cummins, John, jun ...Nelfields, Newent
Custance, John T....R. A. College, Cirencester
Darell, Lionel E....Tretborne Court, Stonehouse
Daubeny, Rev. E. A....Ampney, Cirencester
†Davies, Robert P....Horton, Chipping Sodbury
†Dent, John Coucher...Sudeley Castle, Winchcombe
De Winton, Capt. T....Wallsworth Hall, Gloucester
Dobbs, Samuel Priday...Huntley, Gloucester
Dorington, J. E....Lypiatt Park, Stroud
†Dowdeswell, A. C....Pall Court, Tewkesbury
†Dowdeswell, W. E., M.P...Pall Court, Tewkesbury
Drew, B....Boxwell, Wotton-under-Edge
Drew, Edwd...Leighton, Wotton-under-Edge
†Ducie, Earl of...Tortworth, Wotton-under-Edge
†Edmonds, Giles...Eastleach, Lechlade
Edmonds, William John...Southrope, Lechlade
†Eggington, John Lloyd...Cirencester
Ellett, Robert...Oakley Villa, Cirencester
Elwes, John H....Closeburn House, Cheltenham
Estcourt, George B., M.P...Newnton House, Tetbury
Farmer, Edmund...Moreton-in-the-Marsh
Ferris, John Wakefield...Far Hill Farm, Fairford
†Fitzhardinge, Lord...Berkeley Castle
Fletcher, George...Shipton, Cheltenham
†Fletcher, W. H....Shipton Olliffe, Cheltenham
†Ford, Charles...Horsley, Nailsworth
Fowler, William...Ryle House, Pauntley, Newent
Gardner, John W....Long Street, Tetbury
†Garne, John...Filkins, Lechlade
†Garne, Robert...Aldsworth, Northleach
†Garne, William...Cerney, Cirencester
Garne, W. Gillett...Broadmoor, Northleach
†Golledge, Matthias...Forthampton, Tewkesbury
Goulter, Allen...Hawkesbury, Chipping Sodbury
Haine, George...Over Farm, Gloucester
Haines, John Poole...Boteler House, Cheltenham
†Hampson, John...Ullen Wood, Leckhampton
Handy, Edward...Sierford, Cheltenham
†Harding, John...Dursley.
Harrowby, Earl of, K.G....Norton House, Campden
Hartland, W., jun....Upleadon Court, Gloucester
†Hatherell, W....Newington Bagpath, Wotton-under-Edge
Henry, Francis...Elmestree, Tetbury
Hill, J....Line House, Newent
Holborow, Daniel B....Knockdown, Tetbury
†Holborow, D.C...Bagpath Court, Wotton-under-Edge
Holborow, H....Willesley, Tetbury
Holmes, Colonel...Charlton Kings, Cheltenham
Hone, Henry...Stoke Orchard, Cheltenham
†Hooper, Robert N....Stanshawes Court, Tate
Horne, Thomas...Moreton-in-the-Marsh
Hornblow, W. T....Ripple, Tewkesbury
†Howell, Henry...Coates, Cirencester
Hudson, Charles....Kinsham, Tewkesbury
Hyett, W. H....Painswick.
Iles, Daniel...Fairford Retreat, Fairford
Iles, Richard A....Reevy Farm, Kempsford, Fairford
†Ireland, William...Forthampton, Tewkesbury
James, Isaac...Tivoli, Cheltenham
†Jenkinson, Sir G. Bart., M.P....Eastwood, Berkeley
Jones, George...Upton St. Leonards, Gloucester
Jones, John...Ashleworth, Gloucester
Jordan, William...Charlton Kings, Cheltenham
Key, Lieut.-General...Coates, Cirencester
Kilminster, E. M....Calkerton, Tetbury
†Knight, Edward...High Leadon, Newent
Knight, John...Forthampton, Tewkesbury
Knowles, William...Gloucester
†Lancaster, Thomas...Bownham House, Stroud
†Lane, William...Broadfield, Northleach
†Lawrence, W....Brockworth Park, Gloucester
†Lawton, W. F....Wyck Hill, Stow-on-the-Wold
Leatham, A. W....Miserdine Park, Cirencester
Leigh, William...Woodchester Park, Stonehouse
Lewis, Thomas...Preston, Cirencester
Little, Lewis D....Driffield, Cirencester
Long, Daniel...Whaddon, Gloucester
Lyne, William.. Oddington, Stow-on-the-Wold
Mabbett, John...Stinchcombe, Dursley
Mace, Thomas...Sherborne, Northleach
Makgill, George...Prestbury, Cheltenham
Marsh, W. J....Loridge, Berkeley
Master, Col. T. C....The Abbey, Cirencester
Mathews, A....Pitchombe, Stroud
Morris, Thomas...Maisemore, Gloucester
Mullins, Isaac...Alvington, Lydney
New, Richard E....Hartpury, Gloucester
Nicks, William...Greville House, Gloucester
Parson, Edgecombe...Coates, Cirencester
Peacey, William...Chedglow, Tetbury
Penson, W. Stayt...Baunton, Cirencester
Phillimore, Edward...Cheltenham
†Playne, E. H....Frampton Mansell, Chalfont
Porter, Thomas...Baunton, Cirencester
Porter, William...Kencott, Lechlade
Prevost, Lt.-Col. C....Satterley Grange, Cheltenham
Price, Charles...Quenington, Fairford
Price, W. P....Tiberton Court, Gloucester
Priday, Samuel...Linton, Gloucester
†Probyn, Edmund...Huntley
Pullen, S. C....The Laurels, Itchington, Alveston
Randall, John...Stroud
Rich, Edmund...Willesley, Tetbury
†Rich, Robert...Willesley, Tetbury
†Ricketts, James...Westbury-on-Severn
Roberts, G..Wormington Grange Farm, Winchcombe
Rolt, John...Ozleworth Park, Wotton-under-Edge
†Russell, Sir W., Bt...Charlton Pk., Cheltenham
†Sartoris, Alfred...Abbotswood, Stow-on-the-Wold
Savage, S. P....Leys Farm, Wotton-under-Edge
Savory, Paul Haines...Gloucester
†Shaw, Rev. G. E. F..Edgeworth Rectory, Cirencester
†Skillicorn, W. Nash...Cheltenham
†Smith, C. R....Filkins Hall, Lechlade
Smith, William...Berkeley

†Smith, William...Winchcombe
Snowsell, James...Ampney Knowle, Cirencester
Stewart, Arthur...Saint Bridge Farm, Gloucester
†Stoughton, Thomas A....Owlpen, Uley
Surman, J. S....Swindon Hall, Cheltenham
Surman, William...Maisemore, Gloucester
†Swanwick, R....R. A. College Farm, Cirencester
Swinburne, T. W....Corndean Hall, Winchcombe
†Talbot, George C....Temple Guiting, Winchcombe
†Thackwell, John...Wilton Place, Dymock
†Thorp, Archdeacon, Kemerton Rectory, Tewkesbury
†Timbrill, Robert...Beckford, Tewkesbury
Tombs, John...Hatherop, Fairford
Tovey, Joseph...Cirencester
Trimmer, Edward...Gloucester
Trinder, Edward...Cirencester
Tyler, J. H....Tytherington, Falfield, R. S. O.
Villar, James...Charlton Kings, Cheltenham
Viveash, Oriel...Strensham, Tewkesbury
Waddingham, John...Guiting Grange, Winchcombe
Walker, James...Northleach
Walker, Thomas...Stowell Park, Northleach
Waller, Hugh S....Farmington, Northleach
Wheeler, A. C....Upton Hill, Gloucester
†Whitcombe, George...Tuffley, Gloucester
White, Edwin...Maisemore, Gloucester
Wilkins, Henry...Westbury-on-Severn
†Williams, Henry E....East End House, Fairford
†Withington, James...Prestbury, Cheltenham
Witts, F. R. V..Upper Slaughter, Stow-on-the-Wold
Woolley, John T....Rodmarton, Cirencester
Workman, Joseph....Wotton-under-Edge
Wrightson Professor...R. A. College, Cirencester
Yorke, Joseph..Forthampton Court, Tewkesbury

HAMPSHIRE.

Governors.

Ashburton, Lord...The Grange, Alresford
†Ewtall, Ralph...Andover
†Eversley, Viscount...Heckfield Place, Winchfield
†Hulse, Col. Sir E., Bt..Breamore House, Fordingbridge
†Macdonald, Sir A. K., Bt..Woolmer Lodge, Liphook
Normanton, Lord...Somerley, Ringwood

Members.

Addison, Joseph...Mapledurwell, Basingstoke
Allen, Stephen H....Eastover, Andover
Arnold, Matthew...Westmeon, Petersfield
Attrill, Daniel, jun....Dean Farm, Whitwell, I. W.
Barton, Frank...Heasley Farm, Arreton, I. W.
Beach, W. W. B., M.P....Oakley Hall, Basingstoke
Beadon, Rev. F....North Stoneham Rectory
Best, Rev. Thomas...Red Rice House, Andover
Bethell, Hon. Slingsby...Tangier Park, Basingstoke
Blackburne, J. Taddy...The Camp Farm, Aldershot
Blundell, Joseph...3, Portland Street, Southampton
Bone, Henry...Bisterne, Ringwood
Boxall, W. B....Strathfieldsaye, Winchfield
Brook, Samuel Edwin...Park Farm, Ryde, I. W.
Budd, Francis...Hatch Warren, Basingstoke
Burnett, David...Ashley, Stockbridge
Caird, James A. H....Warren Farm, Micheldever
Cardus, John...Town Hill, West End, Southampton
Carnegie, Hon. J. J....Fair Oak, Petersfield
†Carter, John Bonham, M.P....Adhurst St. Mary's
Chalcraft, H....Millhall Cottage, Alton
Chalcraft, James...Stroud, Petersfield
Chalcraft, William...Bramshot House, Liphook
†Chamberlayne, T....Cranbury Park, Winchester
Chinery, John...Wootton, Milton, Lymington
†Churchill, George...Aldershot, Fordingbridge
Chute, W. L. Wigget...The Vyne, Basingstoke
†Cleeve, H. Lacy...Bradley, Alresford
Coleberd, Robert...Purewell Farm, Christchurch
†Collins, Henry...Aldsworth House, Emsworth
Cumberbatch, L....Queens House, Lyndhurst
Currie, Raikes...Minley Manor, Farnborough
Curtis, Charles E....Farringdon, Alton
Dear, H. C....North Stonham Park, Southampton
Deverell, John...Purbrook Park, Portsmouth
†Dilke, Sir C. W., Bart, M.P....Bedhampton, Havan
Dixon, Cecil B....Shirley Warren, Southampton
†Doridant, Charles...Aldershot Park
Dorrington, Charles H....Otterburne, Winchester
Downs, Henry...Manor House, Basingstoke
Drewitt, Henry...Milvill Farm, Titchfield
†Duncan, George...Coldrey, Alton
Duplessis, Jules...Newtown Park, Lymington
Elphinstone, A....Chewton Glen, Christchurch
Erle, Rt. Hon. Sir W....Bramshot Grange, Liphook
Esdaile, W. C. D....Burley Park, Ringwood
†Eyre, G. E....Warrens, Stoney Cross, Southampton
†Eyre, Robert T....Hartley, Totton, Southampton
†Farr, William Wyndham...Iford, Christchurch
Gater, John...West End, Southampton
Gervis, Sir G. Eliot Meyrick T., Bt...Hinton Admiral, Christchurch
Gilbert, F. W...Little Eastley, Bishopstoke
†Goddard, William R...Glaston Hill House, Eversley
†Gotch, W. H....Chilcombe Farm, Winchester
Hall, Captain Angus W....Claremont, Millbrook
†Hambrough, A. J...Steephill Castle, Ventnor, I. W.
†Heathcote, Capt. E...Blanshard, Lyndhurst
Herbert, Hon. A....Ashley Armwood, Lymington
Hetherington, Robert...Ropley, Alresford
Hewett, James...Posbrooke, Titchfield
†Hylton, Lord...Heath House, Petersfield
†Ivimy, E. T....Herriard Grange, Basingstoke
†Jervoise, A. T. E....Weston Abbott, Odiham
†Jervoise, F. Ellis, J....Herriards Park, Basingstoke
Kent, George E....North End, Portsea
King, C. A....Branksome Dene, Bournemouth
King, W. David...High Street, Portsmouth
†Knighton, Sir William W., Bart....Blendworth Lodge, Horndean
Leedham, William...Andover
Leggatt, H. B....Brownwich, Fareham
Leggatt, S. B....Crofton, Titchfield
Linzee, Robert G....Broxmore Park, Romsey
†Longbourne, John...Ripsley, Liphook
†Longcroft, C. J...Havant

Lyne, R. Seager...Compton, Winchester
Lywood, John...Upper Clatford, Andover
McCalmont, A. L....Ampfield, Romsey
†Malcolm, Mrs....Beechwood, Lyndhurst
Malmesbury, Earl of...Heron Court, Christchurch
Marsh, Matthew H....Ramridge, Andover
†Maxse, Captain, R.N....Holly Hill, Southampton
†Mildmay, Sir H. St. John, Bart...Winchfield
Mills, John...Bisterne, Ringwood
Morris, N. S....Mayfield, Weston, Woolston
†Murray, Major...Ossomsley Manor, Christchurch
Newton, F. H....Gore Farm, Lymington
†Nightingale, W. E....Embley, Romsey
†Ohrly, H. G., jun...Downside, Ventnor, I. W.
Padwick, Frederick...West Thorney, Emsworth
Pain, Thomas...The Grove, Basingstoke
Palmer, George...Greenwood, Bishops Waltham
Parkin, P. W....Ridgemount, Bassett, Southampton
†Peacocke, Warren...Efford, Lymington
Perkins, Walter...Bowling Green Ho., Southampton
†Peterson, A. T. T....Drumdnar, Lymington
†Pinnegar, Christopher...Rockbourne, Fordingbridge
Pratt, Frederick...Westmeon, Petersfield
Purrott, C....Cliftonville, Westend, Southampton
†Raynbird, Hugh...Church Street, Basingstoke
†Ricards, Mortimer...Bure Homage, Christchurch
Robson, William...Summerfield, Bournemouth
Rosling, Edward...Droxford, Southampton
Scott, Arthur J....Rotherfield Park, Alton
Scott, T. R....Porchester Farm, Fareham
Seal, C. W....Herriard Grange, Basingstoke
†Shrubb, J. Lane...Rodlease, Lymington
Simonds, W. B., M.P....Abbot's Barton, Winchester
Simpson, Valentine...Albany, Fareham
†Smith, William...West End, Southampton
†Spooner, W. C....Southampton
†Stratton, James...Chilcombe, Winchester
Tasker, William...Andover
Taylor, Sir Charles, Bart....Forest Lodge, Liphook
†Taylor, H. Minton...Barton, Eastleigh, Southamp.
Thistlethwayte, T....Southwicke Park, Fareham
Thursby, Colonel...Holmhurst, Christchurch
Timson, H....Tatchbury, Totton, Southampton
Toward, Andrew...Castle Road, Carisbrooke, I. W.
Trimmer, Charles...Alton
Turvill, John...Hartley Park Farm, Alton
†Waddington, John...Langrish House, Petersfield
†Walker, James...Buriton Manor Farm, Petersfield
Wallis, Arthur...Basingstoke
Warner, Henry, jun....Farringdon, Alton
Wellington, Duke of...Strathfieldsaye, Winchfield
Wheeler, R....Steephill Farm, Ventnor, I. W.
†Whitear, R. B....Martyr Worthy, Winchester
Whitley, Henry E....Basingstoke
†Winchester, Marquis of...Amport House, Andover
†Wood, John...Sheddon Grange, Alton
Woodman, Richard...Somborne Park, Stockbridge
†Woods, Henry...Warnford, Bishops Waltham
Wooldridge, Henry...Meon Stoke, Bishops Waltham
Young, Captain F....The Terrace, Ryde, I. W.

HEREFORDSHIRE.

Governors.

†Arkwright, J. H....Hampton Court, Leominster
†Clive, Rev. Archer...Whitfield Court, Hereford

Members.

†Alexander, Edward...Leominster
†Allen, B. Haigh...Clifford Priory, Hereford
Armitage, Arthur...Moraston, Ross
Armitage, W. Sugden...The Field, Hereford
†Baillie, Hamilton...Bronsil, Ledbury
Ballard, Philip...Leighton Court, Bromyard
†Barnaby, William...Clater Park, Bromyard
†Bateman, Lord...Shobden Court, Shobden
Beever, Rev. W. Holt...Pencraig Court, Ross
Bennett, James...Ingestone, Ross
†Blissett, Rev. H....Letton Weobley, Hereford
Bray, George...The Haven, Pembridge
Britten, William E....Stapleton, Presteign
Brunsdon, Benjamin...Ross
Cadle, John...Ross
†Carwardine, T. J....Stockton Bury, Leominster
†Chadwick, Elias...Pudleston Court, Leominster
Clark, Thomas...Derndale, Hereford
†Clowes, Peter, L....Burton Court, Pembridge
†Cotterell, Sir H. G., Bart....Garnons, Hereford
†Cranston, Thomas...Little Dilwyn, Leominster
†Davies, E. H....Upper House Eardisland, Pembridge
Dew, Tomkyns...Whitney Court, R.S.O.
Duckham, Thomas...Baysham Court, Ross
†Dunne, Thomas...Bircher, Leominster
Edwards, Henry N....Broadwood, Leominster
Edwards, Sarah...Wintercott, Leominster
Evans, E. M....Llwynbarried, Nantmel, Kington
Evans, H. R., jun....Swanstone Court, Leominster
†Evans, R. W....Eyton Hall, Leominster
†Farr, Richard...Hereford
Garrold, R. H....Hereford
Godwin, William...Lugwardine, Hereford
Greenly, Charles Williams...Titley Court, Titley
Griffithes, Edward...New Court, Hereford
Griffiths, John Harward...The Weir, Hereford
Hall, George...Garford, Yarkhill, Ledbury
†Hall, William...Ashton, Leominster
†Hamilton, John...Ross
Hardwick, Charles...Credenhill, Hereford
Harrison, Colonel Broadley...Kynastone, Ross
†Hawkins, Thos., jun...Mannington House, Hereford
†Haywood, Henry...Blakemere House, Hereford
†Herbert, John Maurice...Rocklands, Ross
Heygate, Captain E. N....Buckland, Leominster
†Higginson, E....Saltmarsh, Bromyard
Hill, Rev. R. P....Bromesberrow, Ledbury
Hopton, John...Canon Frome Court, Ledbury
Hoskyns, C. Wren...Harewood, Ross
Jackson, P. R....Blackbrook, Gresmont, Hereford
†Jowitt, Thomas...The Old Weir, Hereford
Morris, John...Hampton Park, Hereford
Morris, John...Rokeby, Hampton Park, Hereford
Morris, Walter...Dewsall Court, Hereford

Partridge, John...Bishops Wood, Ross
†Pateshall, Evan...Allensmore Court, Hereford
†Pitt, George...Chadnor Court, Dilwyn, Leominster
†Poole, Rev. William...Hentland, Ross
Powell, W. R. Howell...Maesywynne, Whitland
†Power, K. Manley...The Hill Court, Ross
†Prosser, F. Wegg...Belmont, Hereford
Pulley, Joseph...Lower Eaton, Hereford
†Pye, G....Widemarshe Street, Hereford
†Ridler, R. H....Holme Lacey, Hereford
†Riley, John...Putley Court, Ledbury
†Robinson, S....Lynhales, Kington
Rogers, Thomas...Coxall, Brampton Brian
Sainsbury, John B....Overton Farm, Ross
†St. John, Hon. B. M...Munderfield House, Bromyard
Salmon, T. T....Holmer, Hereford
Scudamore, Lieut.-Col....Kentchurch Court, Hereford
Smith, J. Lambourne...Ledbury
†Spencer, Edwin...Bircher, Leominster
Stallard, William...Aylestone Hill, Hereford
Stallard-Penoyre, T. J....The Moor, Hereford
†Stedman, James...Docklow, Leominster
†Stevenson, Capt. C. B....Hennor House, Leominster
†Symonds, T. P....Pengethley, Ross
Taylor, Henry T....Holmer House, Hereford
Taylor, W....Showle Court, Stoke Edith, Hereford
Taylor, William...Thingehill Court, Hereford
†Thomas, Rev. W. Jones...Llan Thomas, Hay
Turner, Philip...The Leen, Pembridge
Turner, Thomas...Merryvale, Ross
Turner, T. A....Staunton-on-Arrow, Leominster
†Vevers, Charles...Ivington Park, Leominster
Walker, John...Westfield House, Holmer, Hereford
†Wight, J. Lane...Tedstone Court, Bromyard
†Yeld, Edward...Moss Hill, Leominster
†Yeomans, John H....Stretton Court, Hereford

HERTFORDSHIRE.

Governors.

†Cowper, Earl...Panshanger
†Dacre, Lord...The Hoo, Welwyn
Essex, The Earl of...Cassiobury Park, Watford

Members.

Allnutt, Albert A....Hunsdon Lodge, Ware
†Allwood, Frederick...Walsworth, Hitchin
Amos, James C..West Barnet Lodge, Chipping Barnet
†Bailey, J....Rose Cottage, St. Stephens, St. Albans
Baird, Jonathan P....Chipperfield, Rickmansworth
†Barnes, C. A....Charlingwood, Rickmansworth
Bates, Thomas...Anstey Hall, Buntingford
Baxendale, Richard B....Blackmore End, Welwyn
†Beldam, Valentine...Royston
†Bennell, Joseph...Hitchin
Best, John B....Stanstead Abbotts, Ware
Booth, E. W....Trent Park Farm, New Barnet
†Bosanquet, H. S....Broxbourne Park, Hoddesdon
Branton-Day, Ralph...Micklefield Green, Rickmansworth.
Brown, John...Tring
Brown, William...Tring
†Carew, R. Russell...Carpender's Park, Watford
†Carnegie, David...Eastbury, Watford
Cater, J. W....West Lodge, Barnet
Clarendon, Earl of...The Grove, Watford
Cock, Charles H....Bridgefoot, Barnet
Coles, Walter T....Bushey Lodge Farm, Watford
Collin, Rev. John...Rickling, Bishop Stortford
Cotterell, Edmund...Anstey, Buntingford
†Crofts, Lieut. R. B., R.N....Great Cozens, Ware
Curtis, Thomas...The Hall, Berkhampstead
†Denton, J. Bailey...Orchard Court, Stevenage
†Doggett, Arthur...Newnham, Baldock
Doggett, Thomas W....Sandon, Royston
Eley, Rev. W. H....Great Wymondley, Stevenage
Elliot, John...Moor Park Farm, Rickmansworth
Elvin, David...Ferney Hill Farm, East Barnet
Faber, C. Wilson...Northaw House, Barnet
Fawcett, E. A....Childwick Hall, St. Albans
Field, James Pope...Hammonds End, Harpenden
†Fordham, E. King...Ashwell, Baldock
Foster, Matthew H....Little Wymondeley, Stevenage
Garrard, C. B. Drake...Lamar Hall, St. Albans
†Green, William B....Charleywood, Rickmansworth
Greville, Lord...North Mimms Park, Hatfield
Hales, C. C....Kingswalden, Hitchin
Hales, Clarke...Bassingbourne, Royston
†Halsey, T. F., M.P....Great Gaddesden, Hemel Hempstead.
†Hanbury, C. A....Belmont House, East Barnet
Hanbury, Robert...Poles, Ware
Heard, William...St. Margaret's, Ware
†Hodgson, Henry T....Harpenden, St. Albans
†Hodgson, William...Gilston Park
†Houblon, J. A...Hallingbury Place, Bishop Stortford
Isham, A. C...Weston Turville, Tring
†Jonas, William...Heydon, Royston
†Kemble, H....Potter's Bar, Barnet
King, Charles...North Lodge Farm, Potter's Bar
Kingsley, Thomas...Boars Croft, Tring
Lawes, J. Bennett...Rothamsted Park, St. Albans
Lees, Benjamin C...Sandon, Royston
Lloyd, John...Kingsbury, St. Albans
†Longman, A. H....Shendish, Hemel Hempstead
†Loyd, W. Jones...Langleybury, Watford
†Marjoribanks, D. C....Bushey Hall Farm, Watford
†Marsh, Richard...Little Offley House, Hitchin
Mello, William...Chadwell, Ware
Mott, Thomas...Much Hadham, Ware
Parker, William...The Park, Ware
†Parris, J. W....Farnham, Bishop Stortford
Parrott, John P....Weston Turville, Tring
Parry, Nicholas...Little Hadham, Ware
†Patmore, James...Hockerhill, Bishop Stortford
Peart, Isaac...Tewin Bury, Hertford
†Perkins, Henry...Thriplow, Royston
†Perkins, Thomas...Hitchin
Pigg, Robert...Beauchamp Farm, Buntingford
†Pollard, Joseph...Highdown, Hitchin
Porter, James...Corney Bury, Buntingford
†Potter, Edmund, Camfield Place, Hatfield
Prout, John...Blount's Farm, Sawbridgeworth

Prout, W. A ...Blounts, Sawbridgeworth
Ranken, W. B....Abbots Langley House
Ransome, John...Wheathampstead Bury, St. Albans
Rix, N....London Colney, St. Albans
Roberts, Edward...Berden Hall, Bishop Stortford
Roberts, M. H....Alms Hoe Bury, Hitchin
†Robinson, Joseph...Berkhampstead
Robinson, Joseph A....Berkhampstead
†Ryder, Hon. G. D...Westbrook, Hemel Hempstead
†Samuda, J. D'A., M P ..Loudwater, Rickmansworth
Sedgwick, A O....Watford
†Seymour, Rev. Sir J H. C, Northchurch, Berkhampstd
Sibley, Charles F....Annables Farm, Harpenden
Silvester, F. Robert...Hedges, St. Albans
Sladen, F. St. Barbe...Hartsbourne Manor, Watford
Sladen, Joseph...Hartsbourne Manor, Watford
†Smith, Abel, M.P....Woodhall Park, Hertford
†Smith, Robert...Goldings, Hertford
Snewing, Charles...Holywell Farm, Watford
Spencer, R. S....Brooklands, Birchanger, Bishops Stortford.
†Strafford, Earl of...Wrotham Park, Barnet
†Surtees, H. E....Dane End, Ware
Sworder, Henry..Hallingbury Hall, Bishop's Stortford
Sworder, John...West Mill Bury, Buntingford
Taylor, John...Aston Clinton, Tring
†Thurnall, Henry...Royston
Tompkins, John...Town Farm, Ivinghoe, Tring
Trower, Captain E. S... Stansteadbury, Ware
Tuck, Rev. G. R....Wallington, Baldock
Walbey, Samuel...Barley, Royston
Wedd, E. A ..Foulmire, Royston
Wilkins, R. U....Broadfield, Buntingford
†Wilshere, C W....The Frythe, Welwyn
†Wimbush, Barnes...New Barnet
Wodehouse, W H....Woolmer's Park, Hertford
Wortham, Biscoe Hill...Royston

HUNTINGDONSHIRE.

Governors.

†Fellowes, E., M P....Ramsey Abbey, Huntingdon
†Manchester, Duke of...Kimbolton Castle, St. Neots

Members.

Addington, Thomas...Wyboston, St Neots
Armstrong, George...Graffham, St. Neots
†Baker, Lake John...Hargrave, Kimbolton
Barford, Valentine...St. Neots
†Battcock, F....Hemingford Abbotts, St. Ives
†Beart, Robert...Godmanchester
†Bevan, G. Innes...Godmanchester
†Bird, John...Yaxley, Stilton
†Brown, Potto...Houghton, Huntingdon
Cranfield, T. J....Rocton House, St. Neots
†Cranfield, William...Buckden, Huntingdon
Daintree, George E....Fenton, Warboys
Daintree, J. O....The Grange, Lolworth, St. Ives
†Day, Samuel...St. Neots
Fuller, Alfred...Ramsey
†Greene, Harry Arthur...Crown Street, St. Ives
†Hall, James...Little Barford, St. Neots
†Heathcote, John M....Connington Castle, Stilton
How, James...Broughton, Huntingdon
†Johnstone, Rev. George...Broughton
Jones, Alfred...Ramsey
†Margetts, Charles...Huntingdon
Middleton, Saville...Water Newton
†Morrison, John...Bushmead Priory, St. Neots
†Newton, G. Onslow ..Croxted Park, St. Neots
†Newton, S. C....The Down, Croxton, St. Neots
†Peppercorne, J. H....Eaton Socon, St. Neots
Purves, Peter...Brampton, Huntingdon
Pyke, Barford...Willingham, St Ives
Rust, George John..Halconbury House, Huntingdon
Sandwich, Earl of...Hinchingbrooke House
Shepperson, J. W ...Forty-foot Bridge, Ramsey
†Sherard, Lord P Castel...Glatton, Stilton
Smith, Thomas...Tilbrook Lodge, Kimbolton
Squire, Edward F....Cross Hall, St. Neots
Street, Frederick...Somersham Park, St. Ives
†Stuart, Lieut.-Colonel...Tempsford Hall, St. Neots
Thornhill, George...Diddington, Huntingdon
†Tillard, Philip...Stukely Hall, Huntingdon
Turner, Jabez...Haddon Grange, Yaxley
Welstead, F....The Cottage, Stonely, Kimbolton
Willson, J. Larkham...Wormsditch, Kimbolton
Windover, Charles S....Huntingdon

KENT.

Governors.

†Brassey, Henry A , M P...Preston Hall, Aylesford
Darnley, Earl of...Cobham Hall, Gravesend
†Harris, Lord...Belmont, Faversham
Loyd, Lewis...Monks Orchard, Bromley
†Torrington, Viscount...Yokes Court, Mereworth

Members.

†Abergavenny, Earl of...Eridge Castle, Tunb. Wells
†Adams, G. T....Hawkhurst
Alexander, J. C....Herne Hill, Faversham
†Alexander, R., C B....Downs House, Yalding
Amos, James, jun....Broomfield, Herne Bay
†Anderson, William...Lesney House, Erith
Andrews, Henry...Great Chart, Ashford
†Appach, Reginald...Maytham Hall, Rolvenden
Aveling, Thomas...Rochester
Awcock, Henry...Oxen Heath, Tunbridge
Baker, Fredk....Manor Farm, Frindsbury, Rochester
Baker, W. de Chair...St. Stephens, Canterbury
Baldwin, W. T....Steed Hill, Maidstone
†Balston, Richard J....Boxley Abbey, Maidstone
Balston, Thomas...Chart Hill, Staplehurst
†Bannerman, Henry...Hunton Court, Maidstone
†Barrow, J. J....Holmewood, Tunbridge Wells
†Bayden, Thomas...Hythe
†Bayden, Thomas, jun....Hythe
†Beale, William...Larkins Farm, Chiddingstone
†Bean, Alfred W....Dansome Park, Welling

†Beard, Frederic...Horton, Canterbury
Beer, James Henry...29, St. George's St., Canterbury
Bell, Matthew...Bourne Park, Canterbury
Best, Major M. G....Boxley, Maidstone
Blenkiron, William...Middle Park, Eltham
†Blow, W. W....Temple Mount, Belvedere Park
†Board, John...Westerham, Sevenoaks
Body, John...The College, Wittersham (Peasmarsh)
†Brazier, Frederick...Sandhurst, Hawkhurst
Brockman, Frederick...Beachborough, Hythe
Brown, James C....Arnold Hill, Leeds, Maidstone
Buckland, John A....Biddenden, Staplehurst
†Burra, William Pomfret...Ashford
Busbridge, T. H....Pimps Court, East Farleigh, Maidstone
Bushell, William...Poulton, Wingham
Butcher, Thomas...Selling, Faversham
Butcher, William...Gosmere, Selling, Faversham
†Campbell-Bannerman H., M.P....Gennings Park, Maidstone
Carr, William...Dene Park, Tunbridge
Carter, William...Boughton Blean, Faversham
Castle, William...Yorke Farm, Strood, Rochester
†Cheesman, Frederick...Little Chart, Ashford
Chittenden, Andrew...Detling, Maidstone
Chittenden, James...Hope All Saints, New Romney
Chittenden, John...Newchurch, New Romney
†Cobb, Herbert M....Higham, Rochester
Cobb, John...Sheldwick, Faversham
Cobb, Robert L....Higham, Rochester
Coles, Edward Robert...Rochester
Collard, Charles...Little Barton, Canterbury
Colledge, John W....Upper Grosvenor Road, Tunbridge Wells
†Colyer, William...North End, Crayford
†Court, P. Simpson...140, Snargate Street, Dover
†Cox, Henry...Trevereux, Edenbridge
Crispe, Henry...Ploggs Hall, Tudely, Tonbridge
†Croft, Sir John, Bart....Kingsdown, Sittingbourne
Curling, Arthur D....Herne Hill, Faversham
Curling, Edwin Henry...Brookland, Whitstable
D'Aeth, N. H....Knowlton Court, Wingham
†Dashwood, Maitland....Hall Place, Bexley
†Dawson, William Edward...Plumstead Common
Day, John...Chilham, Canterbury
†Deacon, John...Mabledon, Tunbridge
†De L'Isle and Dudley, Lord...Penshurst Park
Devas, Charles F....Pickhurst, Beckenham
Dixon, Henry...Frankham, Tunbridge Wells
†Dowse, W. T....Chelsfield Hall Farm, Orpington
Dyke, Sir Wm. Hart, Bart., M.P..Lullingstone Castle, Dartford
†Easton, James...Hoath Court, Blean, Canterbury
Edwards, James L....Rochester
†Elgar, Frederick...St. Margaret's, Rochester
†Ellis, Robert Ridge...Yalding
Evans, R. Percival...Watling Court, Canterbury
Falmouth, Viscount...Mereworth Castle, Maidstone
Field, George...Ashurst Park,
†Filmer, Sir E., Bart...East Sutton Park, Staplehurst
Finn, G. W....Preston, Faversham
Finnis, Sterriker...The Elms, Hougham, Dover
†Fletcher, Major-General E. C....Kenward, Yalding
†Fletcher, Lionel J. W....Kenward, Yalding
†Ford, Sir F. C., Bart....Hartfield, Tunbridge Wells
†Fremlin, W. Arthur...Teston, Maidstone
†Fry, James Thomas...Boston, Bromley
Gardner, William...Bekesbourne, Canterbury
†Geary, Sir W. R. P., Bart....Oxen Heath, Tunbridge
Gibbens, Edward...Minster, Isle of Thanet
Godwin, J. S. S....West Peckham, Maidstone
†Goldsmid, Julian, M.P....Summerhill, Tunbridge
†Goodhart, Charles E....Langley, Beckenham
Goodwin, E. J....Canon Court, Wateringbury, Maidstone
†Gordon, Admiral...Ingledon, St. Michael's, Ashford
Gow-Steuart, Herbert J. S....Fowler's Park, Hawkhurst
Gripper, Edward...West Wickham, Beckenham
Hague, Jenkin...Biddenden, Staplehurst
†Hamilton, W. M....2, Orchard Place, Canterbury
Hammond, William...Hunton, Maidstone
Hankey, G. A....Town Court Farm, Tunbridge Wells
Hardinge, Sir E. S., Bart....Bounds Park, Tunbridge Wells
Hardy, Charles S....Chilham Castle, Canterbury
Hart, John...Frogholt, Newington, Hythe
Hartridge, W. F....East Farleigh, Maidstone
Harvey, J. J....Statenborough House, Sandwich
Harvey, W. F....Thruxted, Chartham, Canterbury
†Hatfield, C. T....Hartsdown House, Margate
Henderson, John...Upton House, Sandwich
†Hilder, W....Wrotham, Sevenoaks
Hilton, Henry...Selling, Faversham
Hilton, Robert S....Harbledown, Canterbury
Hilton, S. M....Brambling, Wingham
Hilton, Captain T....Nackington House, Canterbury
Hoar, Charles A. R....Eden, Beckenham
Hoar, Edward, jun....Otham Rectory, Maidstone
Hodsoll, J. Hackett...Loose Court, Maidstone
†Hohler, Henry B....Fowkham Manor, Dartford
Holding, W. S....Lees House, Yalding, Maidstone
Holmden, James...Marlpit Hill, Edenbridge
Hooper, George W....Cottington Court, Deal
†Hope, A. J. B. Beresford, M.P....Bedgebury Park, Cranbrook
Horner, Edward...May Place, Crayford
†Hughes, Hugh...Brightling, Hawkhurst
Jackson, Thomas...Eltham Park
James, Sir W. C., Bart....Betteshanger, Sandwich
Kibble, Thomas...Green Trees, Tunbridge
†Kingsnorth, Alfred...Great Chart, Ashford
†Kingsnorth, Edward...Brookland, New Romney
Kirkpatrick, Captain J....Monks Horton, Hythe
Kirkwood, James M....Gow Court, Maidstone
Knight, Richard...Bobbing Court, Sittingbourne
Knight, Richard Lake...Bobbing, Sittingbourne
†Lake, Edward...Hill Side, Strood
Lake, Frederick...Rodmersham, Sittingbourne
Lake, J...Newlands, Teynham, Sittingbourne
†Lake, Robert...Oakley, Rochester
†Lake, Thomas...Tonge, Sittingbourne
Langridge, George...Lansdowne Road, Tunbridge Wells
Larking, J. Wingfield...The Firs, Lee
†Laurence, W....Elsfield House, Maidstone
†Leese, C. Stuart...Divan Court, Faversham
Lempriere, Major H....Pembury, Tunbridge Wells

Leney, Charles...Hadlow Place, Tunbridge
Leney, Edward...Hadlow Place, Hadlow
Leney, Frederick...Wateringbury, Maidstone
Lennard, Colonel J. F....Wickham Court, Bromley
Levett, William...Glassenbury, Cranbrook
Lewis, I. H..Gallants Court, East Farleigh, Maidstone
Love, Peter...Sheerland, Pluckley, Ashford
Love, S....The Water House, Shoreham, Sevenoaks
†Loyd, Lieut.-Col. E....Lillsden, Hawkhurst
Luck, Captain F....Hartlip, Sittingbourne
Mace, J. Ellis...Ashford Road, Tenterden
Mac George, John...Great Chart, Ashford
†Maitland, Colonel...Hollywych, Edenbridge
Mannington, A....Staplecross, Hawkhurst
Mannington, Isaac...Ewhurst, Hawkhurst
Manwaring, T...Mare Place, Brenchley, Staplehurst
Marsham, George...Hayle Place, Maidstone
Marten, John...Chilham, Canterbury
Marten, Peter...Bridge Street, Canterbury
†Martin, P. Wykeham, M.P...Leeds Castle, Maidstone
†Matthews, Joseph...St. Lawrence Seal, Sevenoaks
Maylam, William...Pluckley, Ashford
Mercer, W....Grove House, Hunton, Staplehurst
Mills, Sir C. H., Bt., M.P....Wilderness, Sevenoaks
†Mills, J. R...Kingswood Lodge, Tunbridge Wells
Miskin, William...Hoo, Rochester
Mold, William Henry...Bethersden, Ashford
Monckton, Edward...The Hectorage, Tunbridge
Monckton, Frederick...The Cage Farm, Tunbridge
†Moore, Rev. Edward...Theobalds, Hawkhurst
†Moore, Rev. G. Bridges....Tunstall, Sittingbourne
Morland, W. Courtenay..The Court Lodge, Lamberhurst
†Morley, H. Hope...Hall Place, Tunbridge
Morrish, G. M....Park Gate Farm, Chelsfield
Murton, Frederick...Smeeth, Ashford
Murton, William...Tunstall, Sittingbourne
†Neame, Charles...Copton, Faversham
†Neame, Edward...Selling Court, Faversham
†Neame, Edwin...Harefield, Selling, Faversham
Neame, Frederick...Macknade, Faversham
†Neame, H.B., North Court, Lower Hardres, Canterbury
Neame, Percy B....The Mount, Ospringe, Faversham
Neame, Robert...Boughton Blean, Faversham
†Neave, Thomas...Sissinghurst, Staplehurst
Neve, Charles..Amberfield, Chart Sutton, Staplehurst
Neve, George...Sissinghurst, Staplehurst
†Neve, Richard...Benenden, Staplehurst
Noakes, Charles...East Farleigh, Maidstone
†Noakes, John T....Breckley House, Lewisham
†Norman, G. Warde...Bromley
Norton, Robert...Downs House, Yalding
†Page, Henry...Walmer Court, Walmer
†Paine, Jeremiah...Sutton Valence, Staplehurst
†Paterson, Richard...Leesons, Chiselhurst
Peppercorne, Henry...East Malling, Maidstone
Perkins, Thomas...Willesborough, Ashford
Perkins, William...Brabourne, Ashford
Phelps, H. G. Hart...Ridley Parsonage, Wrotham
Phillips, Thomas...West Malling, Maidstone
Philpott, Thomas...Linton, Maidstone
Phipps, Filmer...River, Dover
Pine, Robert...Frosley Court, Maidstone
Playfair, G. Gedge....Errol Villa, Lee, S.E.
Plumptre, Charles J....Pedding House, Sandwich
Plumptre, J. Bridges..Goodnestone Farm, Wingham
†Pomfret, Virgil...Tenterden
Prentice, Edward...Chalk, Gravesend
Pryke, J. P....Aldersfield Hall, Wickhambrook
Purves, Charles...Foxgrove Farm, Beckenham
†Pye, Henry...St. Mary's Hall, Rochester
Pye, James...Knight Place, Rochester
Rammell, W. Lake...Sturry Court, Canterbury
†Ramsbotham, F...Crowborough Warren, Tunbridge Wells
Ramsbotham, J....Crowborough Warren, Tunb. Wells
Ratcliffe, Charles....Womanswold, Canterbury
Reeves, Thomas...Staplehurst
Reeves, William...Chittenden, Staplehurst
Rice, E. Royd...Dane Court, Wingham
Rigden, Henry...Lyminge, Hythe
Rigden, Henry...Saltwood Castle, Hythe
Robinson, John...Wingham, Sandwich
Romney, Earl of...The Mote, Maidstone
Russell, George...Manor House, Plumstead
Russell, John...Sutton-at-Hove, Dartford
Russell, Joseph...Pudding Lane, Maidstone
Russell, Robert...Horton Kirby, Dartford
Rutherford, T. B....Hothfield, Ashford
Ruxton, G. F. Symonds..The Crook Farm, Brenchley, Staplehurst
Salomons, Sir D. L., Bt....Broom Hill, Tunbridge
†Sandford, Marks...Martin, Dover
†Sankey, R. J....South Hill, Ashford
Scott, John...Wouldham, Rochester
†Selmes, J....Tufton Place, Northiam, Staplehurst
Shafto, T. D....Cheveney House, Hunton, Maidstone
Sharpe, W. Burling...Baker's Cross, Cranbrook
Smith, G. Fereday...Grovehurst, Tunbridge Wells
Smith, W....Chimhams, Farningham, Dartford
Smithell, R. Hudson...Hengrove House, Margate
Solly, G. B....Monkton Court, Ramsgate
Sondes, Lord...Lees Court, Faversham
Stanhope, Earl...Chevening, Sevenoaks
†Stilwell, A. F....Sheperdswell, Dover
†Stonham, Frederick...Crayford
Stonham, Henry...Thornham, Maidstone
Stratton, Rev. J. Y....Ditton Rectory, Maidstone
Stunt, Frederick...Highams, Rochester
†Stunt, W. C....Brogdale, Ospringe, Faversham
Sturgess, Thomas...Penshurst, Tunbridge
Swindley, Major...Herr Lackenden Ho., Woodchurch
Sydney, Earl...Frognal, Foot's Cray
Talbot, J. Gilbert, M.P....Falconhurst, Edenbridge
Tattersall, Rev. W....Charlton Place, Bishopsbourne
Taylor, W....Wickham Court Farm, Beckenham
Theobald, Hope...Boughton Aluph, Ashford
Toomer, George E...Preston Court, Wingham
Townend, Thomas...Knockholt
Troutbeck, Robert...20, Week Street, Maidstone
Tunbridge Wells Farmers' Club, Secretary of
Tylden-Pattenson, Captain...Ibornden, Biddenden, Staplehurst
Tyser, G. D....Hollanden Park, Tunbridge
†Umfreville, S. C....Ingress Abbey, Greenhithe
Wakeley, Thomas S....Rainham
†Waldo, E. W. Meade...Stone Wall, Edenbridge

†Wall, William H....Pembury, Tunbridge Wells
Walter, William...Rainham, Sittingbourne
Warde, Ambrose...West Farleigh, Maidstone
Waring, William...Chelsfield
Warington, Robert...Conduit Vale, Greenwich
Waterman, James, jun....Tenterden, Ashford
West, Hon. Mortimer S....Knole Park, Sevenoaks
White, George...Hunton, Maidstone
White, J. Baker...Street End House, Canterbury
†Whitehead, Charles...Barming House, Maidstone
Whitehead, John...West Barming, Maidstone
Whitehead, Richard...West Farleigh, Maidstone
Wilkie, E. Hales...Ellington House, Ramsgate
Wilmot, B. C....Eridge House, Tunbridge Wells
†Wilson, Edward...Hayes, Bromley
†Wilson-Haffenden, Rev. J....Homewood, Tenterden
†Withington, T. E....2, Langton Villas, Blackheath
Wood, John...Singlewell, Gravesend
Woodhams, Frank...Frindsbury, Rochester
Wyld, John...Spitzbrook, Staplehurst
Wyles, Thomas...Frindsbury, Rochester
Yardley, Sir William...Hadlow Park, Tunbridge

LANCASHIRE.

Governors.

†Brooks, W. Cunliffe, M.P...Barlow Hall, Manchester
Devonshire, The Duke of, K.G....Holker Hall
†Ellesmere, Earl of...Worsley Hall, Manchester
†Hoghton, Sir Henry de, Bart....Preston
†Sefton, Earl of....Croxteth, Liverpool
†Skelmersdale, Lord...Lathom House, Ormskirk
Towneley, Colonel Charles...Towneley, Burnley
Winmarleigh, Lord...Bank Hall, Warrington

Members.

Alcock-Beck, William...Outgate (Windermere)
Allen, J. F...Sutton Works, Peasley Vale, St. Helens
Allender, H. J....Breckside Pk., Anfield, Liverpool
Ashburner, G....Low Hall, Broughton-in-Furness
Ashworth, Alfred...Egerton Hall, Bolton
Ashworth, Charles E....Fairfield, Manchester
Askew, W....West Hall, Whittington, Carnforth
†Baldwin, W. J. A....Dalton-in-Furness
†Barton, J....West Leigh Lodge, Leigh, Manchester
Bass, W....Duckenfield Lodge, Ashton-under-Lyne
Bate, J....Fallowfield, Manchester
Baxter, Thomas...Acton Grange, Warrington
Becker, J. L....Foxdenton, Chadderton, Manchester
Beswicke-Royds, C. R. N..Pyke House, Littleborough
†Birchall, Thomas...Ribbleton Hall, Preston
Birket, C....Plungington Hall, Preston
Blackburne, Lt.-Col. Ireland...Hale Hall, Warrington
Blundell, P....Ream Hills, Weeton, Kirkham
†Boddington, Henry...Monton House, Eccles
†Bolden, John L....Hyning, Carnforth
Booth, John...Slyne Grange, Lancaster
†Bouck, John T....Manchester
Bowling, Roger...Burrow House, Scotforth
Bradshaw, William...Reddish Hall, Warrington
Brierley, Charles W....Rhodes House, Middleton
Brogden, Alexander, M.P....Ulverston
Bromley, James...Forton, Garstang
Bromley, John...Lancaster
Brooks, J. M....7, Charlotte Street, Manchester
†Butler, Thomas...Dalton-in-Furness
†Cameron, A. H. F....Shell Road, Liverpool
Carlisle, Thomas P...Merlewood, Grange-over-Sands, Carnforth.
Carr, William...39, Duke's Brow, Blackburn
Carruthers, G. B...Westbourne Terrace, Lancaster
Castellain, Alfred...Liverpool
Catterall, Robert...Kirkham, Preston
†Chadwick, F....The Hermitage, Grimsargh, Preston
Chadwick, James...Prestwich, Manchester
Chandler, Henry...Salford, Manchester
†Clare, C. Leigh...Higher Broughton, Manchester
Clarke, W. B...Barwickstead, Beckermet, Carnforth
Clifton, Thomas H....Lytham Hall, Lytham
†Clowes, Edmund....Carnforth
†Cookson, John...The Firs, Stretford
Cragg, W. Smith...Arkholme, Carnforth
Cranke, John...Fountain Street, Ulverston
Craven, James...Whalley Range, Manchester
Crook, Thomas...Inskip, Great Eccleston
†Cropper, E. W....Moss Bank, Augkton, Ormskirk
Cross, John...78, Cross Street, Manchester
†Cross, William A....Red Scarr, Preston
Crosse, Thomas B....Shaw Hill, Chorley
Croudson, John...Urswick, Ulverston
Culshaw, Joseph...Towneley, Burnley
Cunliffe, Major Ellis...Queen Street, Lytham
Cunliffe, R. A....Myerscough Hall, Preston
Davies, Benjamin...Hayton House, Chorley
Dawson, Edward...Aldcliffe Hall, Lancaster
†Derby, Earl of...Knowsley Hall, Prescot
†De Trafford, Sir H., Bt....Trafford Park, Manchester
†De Trafford, J. R....Croston Hall, Croston
Dobell, G. C....10, North John Street, Liverpool
†Dodson, Charles E....Littledale Hall, Lancaster
†Drewry, George...Holker, Grange
Dugdale, Edward...Park Hey, Blackburn
†Earle, Frederic W....Edenhurst, Prescot
Eastwood, George...Healey Hall, Burnley
Eckersley, James...Burnt House, Chorley
Eckersley, Nathaniel...Standish Hall, Wigan
Eden, Peter...Cross Lane, Salford
Edmondson, T. G....Gresgarth Hall, Lancaster
Ellis, Francis...Trafford Park, Manchester
†Entwistle, John S....Foxholes, Rochdale
Fair, Jacob W....Lytham, Preston
Fair, Thomas...Westwood, Lytham
†Fenton, Joseph...Bamford Hall, Rochdale
†Fenton, William...Beaumonds, Rochdale
†Fielden, John...Dobroyd Castle, Todmorden
†Fielden, Joshua, M.P...Stansfield Hall, Todmorden
†Fielden, Samuel...Centre Vale, Todmorden
Follows, F. W....Victoria Crescent, Eccles
Gaitskell, J....Hall Santon, Holmbrook, Carnforth
†Gamble, David...Gerrard's Bridge, St. Helen's
Gardner, W. L....Newland Hall, Galgate, Lancaster
Garnett, Robert...Wyreside, Lancaster

Garnett, William...Bashall Lodge, Clitheroe
Gerrard, John...Adlington, Chorley
Gillow, Richard C....Leighton Hall, Lancaster
†Gorst, William...Garston, Liverpool
Gould, John...Hyde Hall, Denton, Manchester
†Graham, Rev. P....Turncroft, Darwen
Greatorex, Frederick...Queen's Brewery, Manchester
†Greenall, Gilbert, M.P....Walton Hall, Warrington
†Greene, Thomas...Whittington Hall, Lancaster
†Gregson, Matthew...Toxteth Park, Liverpool
Grundy, Edward S....Reddish Hall, Warrington
†Hannay, R....Springfield, Ulverston
Hare, Theodore J....Crooke Hall, Chorley
Hargreaves, E. H....Kirkham
Harper, William...Bury
†Harrison, W....Samlesbury Hall, Preston
†Haslam, John P....Gilmow House, Bolton
Hathornthwaite, W....Higher Wyersdale, Dolphinholme, Lancaster
Heaton, Captain H....Worsley, Manchester
†Hibbert, Henry...Broughton Grove, Grange-over-Sands, Carnforth
Holliday, James...Lord Street, Liverpool
†Hollings, James C....Astley Bridge, Bolton
†Horton, William T....Skelmersdale Hall, Ormskirk
†Hubback, Joseph...Liverpool
†Hunt, George...Ingol Cottage, Preston
Hurst, Robert...Baillie Street, Rochdale
†Ingram, Joseph...The Elms, Sale, Manchester
Inman, H....Rose Bank, Stretford, Manchester
†Jackson, James...Oakenclough, Garstang
Jackson, James...6, Chapel Street, Preston
†Jackson, Joseph...Calder House, Garstang
Jacson, C. R....Barton, Preston
†Kay, J. R....Bass Lane House, Bury
Kearne, J. H....Mintare Birkdale Park, Southport
†Kendall, James...Halbarrow, Ulverstone
†Kennedy, Myles...Burton Cottage, Ulverstone
Knight, John...Farnworth, Warrington
†Knowles, James...Eagley Bank, Bolton
Lambe, John...Hopefield, Eccles, Manchester
†Lewthwaite, G...Broad Gate, Broughton-in-Furness
Linaker, Peter...22, Broadgate, Preston
Littledale, Harold...Liscard, Liverpool
†Mallinson, John...Corporation Street, Manchester
†Marsland, W....Baguley Hall, Northenden
†Mather, Henry...West Derby, Liverpool
Mayman, B....Water Street, Liverpool
Meller, J. Galloway...Stretford, Manchester
†Mercer, William...Newton, Warrington
†Miller, T. Horrocks...Singleton, Kirkham
Miller, W. P....Winckley Square, Preston
Milner, John...Myerscough, Preston
Morgan, T....Faulkner Street, Manchester
Mould, G. W....Cheadle, Manchester
Moult, William...Knowsley, Prescot
†Mucklow, Edward...Castle Head, Grange
Muirhead, T....Victoria Street, Manchester
†Musgrove, Edgar...West Town, Ormskirk
Neild, Henry...The Grange, Worsley, Manchester
†Newall, Henry...Hare Hill, Littleborough
†Ockleston, W. F....Cheadle, Manchester
Oldacres, Walter...Fairfield, Manchester
†Ormerod, H. M....5, Clarence Street, Manchester
†Park, James...Lightburne, Ulverston
Parker, T. Townley...Charnock, Chorley
†Parkinson, Robert...Northenden, Manchester
Pearson, F. F....Storrs Hall, Arkholme, Carnforth
†Peel, Jonathan...Knowlmere Manor, Clitheroe
Platt, Henry...Werneth Park, Oldham
Polding, James Bede...Burnley
Porter, Wm....Wyre Bank, St. Michael's, Garstang
†Rawstorne, L....Hutton Hall, Preston
†Reed, George, M.D....Royal Infirmary, Manchester
Reynolds, Osborne...Owens College, Manchester
†Reynolds, Dr. W...St. Michael's Hamlet, Liverpool
Richardson, R....Halewood, Liverpool
Robinson, Dixon...Clitheroe Castle
Robinson, J....Huggart's Farm, Brindle, Chorley
Robinson, R. C....Albert Works, Preston
Robinson, W....Darlington Lodge, Warrington
†Rodgett, John...Darwen Bank, Preston
†Rothwell, R. R....Sharples Hall, Bolton
†Royds, A. Hudson...Falinge, Rochdale
†Royds, Henry...Wavertree, Liverpool
†Royds, Rev. John...Heysham Rectory, Lancaster
Ryder, T. B....57A, Church Street, Liverpool
†Schroder, Baron W...12, Rumford Place, Liverpool
Sharman, S....Little Crosby, Liverpool
Shaw, Thomas...Mawdesley, Ormskirk
Sillcock, R....Thornton Hall, Poulton-le-Fylde
Singleton, George...St. Michael's, Garstang
Singleton, John...Stalmire, Poulton-le-Fylde
Skirving, William...15, Queen Square, Liverpool
Slye, William W....Beaumont Castle, Lancaster
Smith, A. M'Kenzie...Kent Street, Liverpool
Smith, Joseph...Cable Street, Lancaster
†Smith, R. C....Parkfield, Swinton, Manchester
Southern, John...Culcheth, Warrington
Spurrier, Henry...Kersal, Manchester
†Standish, W. S....Duxbury Park, Chorley
Stanley, Edward...The Height, Grange
†Stanley, Lieut.-Col. the Hon. F. A., M.P...Witherslack Hall, Grange, Carnforth
†Starkie, Major...Huntroyde, Burnley
†Starkie, John P. C., M.P...Ashton Hall, Lancaster
Statter, T....Stand Hill, Whitefield, Manchester
Statter, T., jun....Stand Hill, Whitefield, Manchester
Stocks, Charles...Cheadle, Manchester
Storey, George...Braunshawe House, Burnley
Storey, Joseph...Crosslands, Lancaster
Suttle, W. Benoni...Whalley Grange, Manchester
Talbot, W. Hawkshead...Hartwood Hall, Chorley
Tatton, T. W....Wythenshawe Hall, Northenden, Manchester
†Taylor, Samuel...Eccleston Hall, Prescot
Thom, John...Larkhill, Chorley
†Tinne, John A...Briarley, Aigburth, Liverpool
Townend, John...Shodsworth Hall, Blackburn
Tunstall, James...St. Michael's, Garstang
Vickers, Thomas...Cheetham Hill, Manchester
†Wadham, E....Mill Wood, Dalton-in-Furness
†Walker, Ormerod O....Chesham, Bury
†Walker, William T... Clapham, Lancaster
Wearing, Allen...Birkby Hall, Cark-in-Cartmel, Grange-over-Sands, Carnforth

†Whalley, C. L....Richmond House, Lancaster
Whalley, R....Mill Green, Bold, Warrington
Whitworth, H....96, King Street, Manchester
Whitworth, Sir J...The Firs, Fallowfield, Manchester
Willacy, Robert...Penwortham Priory, Preston
†Willis, H. R. D'Anyers...Halewood, Liverpool
†Wilson, T. Newby...The Landing, Ulverston
Wilson, William...Oubas Hill, Ulverston
Wood, James...Oaklands, Walton, Liverpool
Wood, James...Haigh Hall, Wigan
†Woodburne, Myles..Sandscales, Dalton-in-Furness
†Woodburne, Thomas...Thurston Ville, Ulverston
Woodhouse, John...Skale Hall, Lancaster
Worrall, Edward...Whalley Range, Manchester

LEICESTERSHIRE.

Members.

Allen, Thomas...Thurmaston, Leicester
Angrave, Thomas C....East Leake, Loughborough
Arkwright, A. W...Broughton Astley House, Lutterworth
Bailey, Edward...Leicester
Ball, George...North Kilworth (Rugby)
Barber, William...Congerstone (Atherstone)
†Barwell, Thomas...Leicester
Beale, Joseph...Wolsey Grange, Hinckley
Berry, Edmund...Ashley, Market Harborough
Bland, T. H....Dingley Grange, Market Harborough
Brewitt, T. B....Sanham House, Melton Mowbray
Brook, Charles...Enderby Hall, Leicester
†Brooke, Sir W. de Capel, Bt....The Elms, Market Harborough
†Brown, G. Fowler...Newtown, Desford, Leicester
†Bruxner, Rev. G. E., M.A....Thurlaston, Hinckley
Bryan, Frederick T....Humberstone, Leicester
Carver, Robert...Ingarsby, Leicester
Cheney, Edward H...Gadsley Hall, Melton Mowbray
Collins, Charles...Burbage, Hinckley
Cooper, Alfred Allen...The Hall, Wigston, Leicester
Coy, John...Market Place, Leicester
Creswell, R. W....Ravenstone, Ashby-de-la-Zouch
Davis, John...Wykin Hall, Hinckley
Doubleday, E., M.D...Long Clawson, Melton Mowbray
Eggleston, Edward J....Great Peatling, Lutterworth
Ellis, James...Glenfield, Leicester
Everard, William...Narboro', Enderby, Leicester
Farnham, E. B....Quorndon House, Loughborough
Fisher, E. Knapp...Market Harborough
Fowke, Sir F. T., Bart....Lowesley Hall, Leicester
Freer, Charles T....The Coplow, Billesdon, Leicester
Freer, Jesse...Rothley, Loughborough
German, George...Normanton-le-Heath, Ashby-de-la-Zouch
German, John...The Common, Ashby-de-la-Zouch
Goodchild, Philip...Glen Parva, Leicester
Hack, Matthew...Leicester
Hall, W. Henry...Peatling Magna
Hamel, A. John...44, London Road, Leicester
Harris, George Shirley...Leicester
Harris, John Dove...Knighton, Leicester
Harris, Samuel...West Coates Grange, Leicester
†Harrison, John...The Willows, Leicester
Hassall, Joseph...Great Wigston, Leicester
Hazlerigg, Sir A. Grey, Bart...Noseley Hall, Leicester
Henson, William...Burtonfields, Hinckley
Hill, Rev. Abraham...Spa Place, Leicester
†Holford, Thomas... Papillon Hall, Market Harborough
†Hoskyns, Rev. H. J....Blaby Rectory, Leicester
Hughes, Alfred..Brampton Ash, Market Harborough
†Humphreys, Henry...Wood House, Loughborough
Innocent, A....Kibworth Beauchamp, Leicester
Johnson, T. F....Stoneygate, Leicester
Johnson, Walter F....Leicester
Johnson, W. H....Old Hall, Braunston, Leicester
Kemp, Francis...Saddington, Market Harborough
Key, William H....Enderby Grange, Narborough, Leicester
Knight, Captain Gregory...Narborough, Leicester
Leadbeater, J. B..Thorpe Satchville, Melton Mowbray
†Marriott, C....Cotesback Hall, Lutterworth
Miles, Roger Dutton...Keyham, Leicester
Mudford, Joseph...Hoe Fields, Hinckley
†Morris, Thos., jun....Walcote Fields, Lutterworth
†Mowbray, Major...Overseal, Ashby-de-la-Zouch
Nuttall, Thomas...Manor House, Beeby, Leicester
Oldacres, Matthew...Clipston, Market Harborough
†Paget, G. E....Sutton Hall, Loughborough
†Paget, T. T....Humberstone, Leicester
Painter, Robert...Friar Lane, Leicester
Pearson, Captain W....Walcote, Lutterworth
Pilgrim, S. C....The Outwoods, Hinckley
Pochin, Capt., R.N....Braunston House, Leicester
Porter, Henry...Wanlip, Leicester
Richards, W....Belgrave, Leicester
Robinson, Alfred...Gas Works, Leicester
†St. Maur, Lord A....Burton, Loughborough
†Salt, William H....Maplewell, Loughborough
Sarson, John...Welford Place, Leicester
Scott, Thomas J....Stretton Baskerville, Hinckley
Scott, W....Normanton Turville, Hinckley
Scotten, Richard J....Monks' Kirby, Lutterworth
Shakespears, John...Copson Magna, Hinckley
†Sharman, Warren...Melton Mowbray
Shaw, George, M.D....Leicester
†Simpkin, Joseph...Narborough, Leicester
Smith, John T....Kibworth, Leicester
†Smith, Percy L....Great Peatling Lodge, Lutterworth
Spencer, Francis...Claybrooke, Lutterworth
Stone, Joseph C....Rowley Fields, Leicester
Stone, N. C....Aylestone Hall, Leicester
†Stratford, H. S....Thorpe Lubenham, Market Harborough
†Tailby, W. Ward...Skeffington Hall, Leicester
Taylor, John...Belgrave Gate, Leicester
Tower, B. R. C....Neville Holt Cottage, Market Harborough
Vaughan, G. L....Belmont Villa, Leicester
†Voile, Thomas...Frolesworth, Lutterworth
Wale, Henry...Woodlands, Narborough
Warner, Thomas...The Abbey, Leicester
†Wartnaby, Mrs....Market Harborough

Watson, James R....Ashley, Market Harborough
Woodcock, H. C....Rearsby, Leicester
Woodroffe, W. Solomon..Normanton, Loughborough
†Woolley, William E....Loughborough
Worswick, Major...Normanton Hall, Hinckley
Wright, Thomas...Wanlip, Leicester
Wright, William...Shoby Priory, Melton Mowbray

LINCOLNSHIRE.

Governors.

Astley, Lt.-Col. Sir J. D., Bt....Elsham Hall, Brigg
Aveland, Lord...Normanton Park, Stamford
Chaplin, Henry, M.P....Blankney Hall, Lincoln
†Dysart, Earl of...Buckminster Hall, Colsterworth
Exeter, Marquis of...Burleigh House, Stamford
†Nisbet-Hamilton, Rt. Hon. R. A...Bloxholme Hall
†Rutland, Duke of, K.G....Belvoir Castle, Grantham

Members.

†Alington, G. M....Swinhope House, Grimsby
Allen, Edward...Sleaford
Anderson, J. C....Avenue Farm, Long Sutton
Ashton, William...Horncastle
Amcotts, Colonel, M.P....Hackthorn Hall, Lincoln
Bartholomew, W....Waddington Heath, Lincoln
Barwell, Thomas...Spalding Common
Battle, John R....Potter Hanworth, Lincoln
Bell, Ancill...Manor House, North Kyme, Sleaford
Beridge, Rev. Basil...Algarkirk, Spalding
†Bettinson, Richard...Thurlby,Bourne
Bland, George...Coleby Hall, Lincoln
Bonnall, John...Grantham
Borman, Joseph...Irby, Caistor
†Bramley, Charles...Fiskerton Hall, Lincoln
Briggs, D. Grant...Calcethorpe Manor, Louth
Brown, Pereira...Glentworth Hall, Lincoln
Burkill, E. W...Winteringham, Brigg
Burt, Walter...Willingore, Grantham
Byron, John...Kirby Green, Sleaford
Caborn, Richard S....Denton, Grantham
†Calvertt, J. S...Tothill Manor House, Alford
Campain, Joseph George...Cowbit, Spalding
Campain, S. W....Deeping St. Nicholas, Spalding
Cartwright, T....Pillar Farm, Dunston, Lincoln
Casswell, George...Gosberton, Spalding
Casswell, John Henry...Laughton, Folkingham
Cave, Henry Haddon...Brigg
Cheavin, George...Boston
†Clarke, Charles...Ashby-de-la-Launde, Sleaford
Clarke, John Algernon...Long Sutton
†Clayton, Nathaniel...Newland House, Lincoln
Coates, Thomas...Ravendale, Grimsby
Conington, Clement...Hagworthingham, Spilsby
†Constable, J. Goulton...Walcot, Brigg
Corringham, R. W....Lound House, Haxey (Bawtry)
Coultas, James, jun....Spittlegate, Grantham
Coupland, John G....Freeston, Boston
†Crawley, John, jun....Manor House, Holbeach
Crawley, Lewis...Keightley House, Holbeach Marsh
†Crofts, Rev. C. D....Caythorpe Rectory, Grantham
Dalton, James...Fillingham Manor, Lincoln
Dalton, T. B....Storton Scawby, Brigg
†Day, Charles...Easton, Stamford
†Day, Nevile...Easton, Stamford
Dean, Seth Ellis...Dowsby Hall, Folkingham
Dean, W. North...Horbling, Folkingham
†Dixon, John William...North Owersby, Market-Rasen
†Dixon, Thomas Parkinson...Caistor
Duckering, R. E....Northorpe, Kirton Lindsey
Dudding, Henry...Panton House, Wragby
Dudding, William...Lambcroft, Louth
Ealand, John Robert...Aisthorpe, Lincoln
†Ellison, Major R. G ...Boultham Hall, Lincoln
Epton, Robert J....Newball, Lincoln
Everington, W., jun....Skegness, Burgh-le-Marsh
Fane, Colonel F....Fulbeck Hall, Grantham
†Fieldsend, Charles R....Kirmond, Market Rasen
Fletcher, Thomas...Long Bennington, Grantham
†Foster, H. Y. West...Cranwell Lodge, Sleaford
Foster, William...Canwick House, Lincoln
Fox, William...Brook Farm, Dunston, Lincoln
Frankish, William...Limber Magna, Ulceby
†Fytche, J. Lewis...Thorpe Hall, Elkington, Louth
†Garfit, Arthur...Scothern, Lincoln
Gibbons, Joseph...Cadney, Brigg
†Gibson, John Kirk...Ingleby, Lincoln
Gibson, Thomas...Stamford
Grantham, Lieut.-Col. H. V. .West Keal Hall, Spilsby
†Greenham, James...Blankney, Lincoln
†Greetham, John...Stainfield Hall, Wragby
Hack, Algernon...Buckminster, Grantham
Harris, Edward...Horbling Vicarage, Folkingham
Hayes, Henry...Stamford
Hayward, Charles J....Washingborough, Lincoln
Hayward, C. P....Beaumont Manor, Lincoln
†Heneage, Edward...Hainton Hall, Wragby
Hessletine, W...Beaumont Cote, Barton-on-Humber
Hill, Joshua...Poolthorne, Brigg
Hilliam, Captain T....Willesby Hall, Spalding
Hobson, John George...Curlew Lodge, Long Sutton
Holland, James...Deeping St. Nicholas, Spalding
Holland, John Wells..Deeping St Nicholas, Spalding
Holland, William...Market Deeping
†Horner, James B ...Lincoln
Hornsby, Richard...Spittlegate, Grantham
Howard, E. J....Rise Farm, Nocton, Lincoln
Howard, R. G. F....Temple Bruer, Lincoln
Hunt, William...Deeping St. Nicholas, Spalding
†Hurdman, J. E...Marcham-le-Hill, Horncastle
Hutton, William...Gate Burton, Gainsborough
†Jarvis, G. K....Doddington Hall, Lincoln
Jeffrey, G. E....Rutland Works, Stamford
Jekyll, John...Newland, Lincoln
Johnson, G. W....Casewick Lodge, Stamford
Keeble, George...Timberland, Sleaford
†Kesteven, Lord...Casewick, Stamford
†Keyworth, H. J....Cottesford Place, Lincoln
†Keyworth, J. R. H....Greestone House, Lincoln
†King, John R....North Ormsby, Louth
Kingston, Samuel...Spalding
Kirk, Charles...Sleaford
Kirkby, Thomas...Cuxwold, Caistor

Kirkham, John...Cadeby Hall, Grimsby
Kirkham, Thomas...Biscathorpe House, Louth
Lister, Charles...Coleby Lodge, Lincoln
†Livesey, Rev. T....Stourton Hall, Horncastle
†Locock, Edmund...South Elkington, Louth
†Lucas, Rev. C. H....Edith Weston, Stamford
†Lucas, Lieut. Col. R....Edith Weston, Stamford
Lynn, John...Church Farm, Stroxton, Grantham
Mackinder, Harwood...Langton Grange, Spilsby
Mackinder, Herbert...Mere Hall, Lincoln
Mackinder, Robert...Langton, Spilsby
Macvicar, Neil...Kirmond, Market Rasen
†Maddison, G. Wilson...Partny, Spilsby
Marris, Thomas...Ulceby
†Marshall, Frederick C....Riseholme, Lincoln
Marshall, Frederick R....Elsham, Brigg
Marshall, James...Gainsborough
Marshall, William F....Branston Villa, Lincoln
Martin, David...Wainfleet
†Martin, George...Hubert's Bridge, Boston
†Martin, James...Wainfleet
†Martin Robert...Asterby, Horncastle
Mason, W. N....Rigsby, Alford
Melville, Hon. A. Leslie...Branston Hall, Lincoln
†Melville, A. S. Leslie...The Longhills, Lincoln
Melville, C. Leslie...Branston Hall, Lincoln
Morley, R. Newcombe...Leadenham, Grantham
Mundy, C. J. Massingberd..Old Bollingbroke, Spilsby
†Nainby, C. M....Barnoldby-le-Beck, Grimsby
Needham, J. L....Hutloft Grange, Alford
Nelson, John...Kettleby Thorpe, Brigg
†Nelson, John...Wytham House, Louth
Nidd, C. W....Creeting Manor Farm, Stamford
†Packe, G. Hussey...Caythorpe Hall, Grantham
Paddison, Edward...Ingilby, Lincoln
†Palmer, Rev. P. H.....Wolsthorpe, Grantham
Pears, John...Mere, Lincoln
†Pears, Thomas...Hackthorne, Lincoln
Pickworth, W....Deeping Bank, Crowland
Pigott, William...Brigg
Plowright, T. J....Pinchbeck, Spalding
†Pogson, F. M....Caythorpe, Grantham
Pogson, S. M....Anwick, Sleaford
Porter, J. T. B....Lincoln
Pratt, Frederick...Greatford, Stamford
Proctor, H. M....Hill House, Wykeham, Spalding
Reynolds, W. S....Spalding Common
Richardson, John...Lincoln
Richardson, William...Limber Magna, Ulceby
Robinson, Henry...Hough-on-the-Hill, Grantham
†Robinson, J. W....Titton Hall, Wyberton, Boston
Robinson, R., sen....Sedgebrook, Grantham
Robson, James...Brackenborough, Louth
Ruston, Joseph...Lincoln
†St. Albans, Duke of...Redbourn Hall, Brigg
Searson, Robert...Cranmore Lodge, Market Deeping
†Seels, Henry John...Wainfleet Hall
Sharpe, William...Mavis Enderby, Spilsby
†Sharpe, W. Taylor...Baumber Park, Horncastle
†Sharpley, Coates...Kelstone Hall, Louth
†Sharpley, Henry...Acthorpe, Louth
†Sharpley, Isaac...Boswell House, Louth
Sheffield, Sir R., Bart....Normanby, Brigg
†Shuttleworth, Alfred...Heighingham Hall, Lincoln
†Shuttleworth, Joseph...Hartsholme Hall, Lincoln
†Sills, W....Casthorpe, Grantham
†Simonds, J. Cabourne...Fishtoft, Boston
†Skelton, E. Dunkley...Sutton Bridge
Skipworth, G. B....Moorton House, Caistor
Slator, Thomas...Market Place, Boston
†Smyth, William H....South Elkington, Louth
Snow, Cyprian...Manor Farm, Dunston, Sleaford
Snow, James M....Metheringham, Sleaford
Sowerby, Francis...Aylesby, Great Grimsby
Sowerby, John, jun....Beelsby, Grimsby
†Standering, William...Curlew Lodge, Long Sutton
†Stanhope, J. Banks...Revesby Abbey, Boston
Swallow, W....Chapel Farm, Barton-on-Humber
Thorold, Sir J. H., Bart....Syston Park, Grantham
†Thorold, Richard...Weelsby Hall, Grimsby
Tindall, Charles William..Aylesby Manor, Grimsby
†Tindall, J. W...Ashfield House, Branston, Lincoln
†Tomlinson, Bruce...Asgarby, Sleaford
Tomlinson, James...Sutton Marsh, Long Sutton
Turner, John...The Grange, Ulceby
†Turnor, Christopher...Stoke, Grantham
†Turnor, Edmund, M.P....Panton Hall, Wragby
Tuxford, J. S....Skirbeck Terrace, Boston
Vincent, Thomas...Harlaxton, Grantham
†Webb, James...Melton Ross, Ulceby
Webster, James...Peakirk, Market Deeping
Welby, J. Earle...Allington Hall, Grantham
Welby, Sir W. Earle, Bart., M.P....Newton House, Folkingham
West, John...Melton Ross, Brigg
Wetherell, W. Squires...Lincoln
Whitehead, William...Etton, Market Deeping
Wilson, Edward H....Hagworthingham, Spilsby
Wilson, Francis...Ludford, Market Rasen
Wilson, Porter...3, Westgate, Louth
†Wingfield, J. H. Lee...Tickencote Hall, Stamford
†Winn, Rowland, M.P....Appleby Hall, Brigg
†Wood, Bennett W....Humberstone, Great Grimsby
Wood, William...Habrough, Ulceby
Wright, Robert...Nocton Heath, Nocton
†Wyles, Robert...Little Ponton, Grantham
†Yates, Henry...North Parade, Grantham

MIDDLESEX.

Governors.

Allcroft, John D....108, Lancaster Gate, W.
†Cambridge, H.R.H. The Duke of, K.G....Gloucester House, Piccadilly
†Fuller, Francis...3, Whitehall Gardens, S.W.
†Gibbs, B. T. Brandreth...47, Half Moon St., W.
Rigg, Jonathan..4, Chester Place, Hyde Park Square

Members.

†Acworth, Nathaniel B....The Hook, Northaw
Addison, John..6, Delahay Street, Westminster, S.W.
Alison, John...90, Lancaster Gate, W.
†Allender, G. M....6, Dawson Place, Bayswater, W.

†Amies, W. S....234, Liverpool Road, Islington, N.
Arnold, James...35, West Smithfield, E.C.
Arnott, T. Reid..Bramshill, Harlesden Green, N.W.
Badcock, P....Aldridge Road Villas, Westbourne Pk.
Baillie, William H....43, Norfolk Square, W.
Baily, John...113, Mount Street, Berkeley Square, W.
Baker, C. N..Half Moon Passage, Gracechurch St., E.C.
†Barclay, G. R....Oxford and Cambridge Club, S.W.
†Barker, H. B. R....University Club, Suffolk St., W.
Barnett, John...Coleraine House, Stamford Hill
†Bassett, R...21, Roland Gardens, South Kensington, S.W.
Batt, William Henry...West Drayton, Uxbridge
Beale, E. J....237, High Holborn, W.C.
Beauchamp, Charles D....93, Lansdowne Road, W.
Bell, John M....490, Oxford Street, W.
†Birkbeck, Robert...20, Berkeley Square, W.
Birt, Jacob...23, Sussex Gardens, Hyde Park, W.
Blanshard, Richard...53, Chancery Lane, W.C.
Blyth, H. A....94, Portland Place, W.
†Blyth, James...2, Park Crescent, Portland Place
Boards, Edward...Edmonton, N.
Bower, Joseph J....42, Glasshouse Street, W.
Bowler, Wm. Anthony...Craven Street, Strand, W.C.
Bradford, Thomas...142, High Holborn
Bramwell, F. J..37, Gt. George St., Westminster, S.W.
Brewster, J....Metropolitan Cattle Market, Islington
Brown, Professor G. T....Veterinary Department, Privy Council Office, Princes St., S.W.
Buckland, Thomas, jun....Wraysbury, Staines
Burgess, William...Holborn Viaduct, E.C.
Burney, George...Millwall, E.
Caird, James, C B....3, St. James's Square, S.W.
†Calvert, Frederick...38, Upper Grosvenor Street, W.
Carson, J. A....La Belle Sauvage Yard, Ludgate Hill
†Cathcart, P. H....16, Oakley Square, N.W.
Chadwick, Alfred J....27, Belsize Park
†Chambers, W...United Univ. Club, Pall Mall, S.W.
Chapman, Thomas...14, Cockspur Street, S.W.
†Claridge, William...51, Brook Street, W.
†Clarke, Robert B....Pall Mall Club, S.W.
Clarke, T. Truesdale...Swakeleys, Uxbridge
Clive, Lieut. Col. the Hon. G. W. Windsor, M.P....53, Grosvenor Street
Clowes, Wm....51, Gloucester Terrace, Hyde Pk., W.
Clutterbuck, R....8, Great Cumberland Place, W.
Clutton, Henry...9, Whitehall Place, S.W.
Clutton, John...9, Whitehall Place, S.W.
†Clutton, John Henry...9, Whitehall Place, S.W.
Clutton, Robert George...9, Whitehall Place, S.W.
Cope, John A. M....3, Lancaster Gate, W.
Corbet, H....365, Strand, W.C.
Cotton, General F. C....3, Longridge Road, South Kensington, S.W.
Couchman, J. W....Pembury Road, Tottenham
Cowper, E.A., C.E....6, Gt. George St. Westminster
Craigie, P. G..Hartley Ho., Lower Heath, Hampstead
Crisp, Edwards, M.D....42, Beaufort Street, Chelsea
Crutchley, P. H....Sunninghill Park, Staines
Cuff, J. H....New Cattle Market, Islington, N.
†Cummins, E. R....Moat House, Enfield
Daniels, Philip J ...5, Fenchurch Street, E.C.
Daubeny, Robert.2, King's Bench Walk, Temple, E.C.
†Davis, R....9, St. Helen's Place, Bishopsgate, E.C.
Day, Thomas...22, Dorset Street, Baker Street, W.
De Pass, Daniel...9, Delamere St., Westbourne Sq.
†Derham, William...Hazlewood, Palmer's Green, N.
De Salis, Rev. Henry J....Portnall Park, Staines
Driver, Robert Collin...4, Whitehall, S.W.
†Druce, S. B. L....New Square, Lincoln's Inn, E.C.
Dudgeon, J....17, Kensington Gate, W.
Dunlop, A. M....3, Old Palace Yard, S.W.
†Dunn, Thos...1, Prince's Gardens, S. Kensington, S.W.
†Dyer, Lieut.-Colonel...14, Redcliffe Square, West Brompton
†Elliot, J. Lettsom...C4, Albany, Piccadilly, W.
Enfield, Viscount...7, Charles Street, Berkeley Sq., W.
Erichson, H. G....7, Gt. Winchester St. Buildings, E.C.
Evans, Price J....2, Leadenhall Street, E.C.
Fawkes, Algernon..2, Seymour St., Portman Sq., W.
†Fellowes, James...6, Bryanston Square, W.
†Field, Barclay...26, Hill Street, Berkeley Sq., W.
†Field, Henry...Conservative Club, S.W.
†Field, William...224, Oxford Street, W.
†Fitzwygram, Lieut.-Col. F....4, Portland Place, W.
†Fletcher, John Philip...Sunbury
Fowler, Robert...71, Cornhill, E.C.
†Freebody, W. Yates...239, Hackney Road, N.E.
†Gibbs, Henry H..St. Dunstan's, Regent's Park, N.W.
Gibbs, Thomas...26, Down Street, Piccadilly, W.
Glasier, William R....41, Charing Cross, S.W.
†Gooch, John V....105, Pall Mall, S.W.
Graham, Walter...West Drayton, Uxbridge
†Grant, Colonel W. L....22, Hyde Park Street, W.
Grantham, R. B., C.E...22, Whitehall Place, S.W.
Greening, E. Owen...47, Millbank Street, S.W.
†Grey, Charles G....55, Parliament Street, S.W.
†Grey, The Hon. Sir F. W. G., C.B..Lynwood, Staines
†Grosvenor, Lord Richard, M.P...76, Brook Street, W.
Guidon, Robert...38, Hill Street, W.
†Gurney, Right Hon. Russell, M.P..8, Palace Gardens, Kensington, W.
Haig, G. A....7, Argyle Street, Regent Street, W.
†Hall, J. Orde..1, Brunswick Row, Queen's Sq., W.C.
†Hall, Captain Marshall...7, Savile Row, W.
Hall, Richard...37, Great George Street, S.W.
Hall, T. Farmer...29, Warwick Square, S.W.
Hammick, H. H....11, Pall Mall, S W.
Harcourt, Colonel...5, Carlton Gardens, S.W.
Harrison, J. T....Thornhill, Castlebar, Ealing
†Haslewood, L. R..194, Gresham Ho., Old Broad St., E.C.
†Hay, C. A....127, Harley Street, N.W.
†Hayne, John...24, Gloucester Sq, Hyde Pk., N.W.
Hempleman, F. T....Belle Isle, York Road, N.
†Heseltine, E....6A, Austin Friars, E.C.
†Heywood, Jas...26, Palace Gardens, Kensington, W.
†Hibbert, P. E. T....14, Hill Street, W.
Hicks, Leonard H....Paddock Lodge, Kentish Town
Hill, Henry...52, Queen's Gate Terrace, S.W.
Hilliard, W. E....Cowley House, Uxbridge
†Holman, Stephen...Spring Lodge, Ealing
Hunt, E. Bradley...Hayes, Uxbridge.
Hunt, Edward...37, Mark Lane, E.C.
Hutton, Robert..74, Gloucester Pl., Portman Sq., W.
Jemmett, W. S....Club Chambers, Regent Street, W.
Jessop, Joseph...Grove Farm, Chiswick

†Jodrell, Sir E. R., Bart....64, Portland Place, W.
Johnson, A. H....Gunnersbury House, Isleworth
Johnson, A. H., jun....Hanger Hill Farm, Ealing
Johnson, C. W....36, Mark Lane, E.C.
Johnson, E. Lionel, jun....59, Mark Lane
Johnstone, E....3, King's Bench Walk, Temple, E.C.
†Jonas, Henry...4, Whitehall, S.W.
†Kelk, John W....Bentley Priory, Stanmore.
Key, Sir Kingsmill G., Bart....Holborn Viaduct, E.C.
King, William...Denham, Uxbridge
Kingsbury, E. W....George Yard, Lombard St., E.C.
Labalmondiere, G....Athenæum Club, S.W.
†Laurie, A....10, Charles Street, St. James's, S.W.
†Lees, Charles...23, Philpot Lane, E.C.
†Locock, Frederick...Oxford and Cambridge Club, S.W.
†Longbourne, W. F....7, Lincoln's Inn Fields
Lott, John...156, Victoria Park Road, N.E.
Lucan, Earl of...36, South Street, Park Lane, W.
Macadam, C. T....109, Fenchurch Street, E.C.
McDougall, James T....10, Mark Lane, E.C.
Mackay, A. S. H....Powis Square, Kensington Park
Mackay, Hugh...155, Fenchurch Street, E.C.
†Malcolm, Major-General...67, Sloane Street, S.W.
†Malcolm, John...7, Great Stanhope Street, W.
Maple, John...Bedford Lodge, Hampstead, N.W.
†Marjoribanks, E., jun....59, Strand, W.C.
Markby, J. R....9, Whitehall Place, S.W.
Marshall, Rev. C....9, South St., Finsbury Sq., E.C.
Martin, F. B. P...Oxford and Cambridge Club, S.W.
Mason, Rush F....5, Upper Thames Street, E.C.
Maude, Col. G. A., C.B....Hampton Court Stud Farm
†Meyer, James...Forty Hall, Enfield
Milburn, R....76, Church Lane, Whitechapel, E.
Mocksford, W. G. S....57½, Old Broad Street, E.C.
Monro, M. M....Enfield
Moore, James...11, Upper Berkeley Street, W.
Moore, J....2, Grosvenor Place
†Morrison, F..8, Cromwell Houses, S. Kensington, W.
Morton, Francis....1, Delahay Street, S.W.
Morton, J. Chalmers...Harrow, N.W.
†Morton, J. D....19, Parliament Street, S.W.
Nicholay, J. A....West Drayton
†Nicholson, W....4, Sussex Square, Hyde Park, W.
Nickisson, John...Stock Exchange, E.C.
†Oakley, Christopher...10, Waterloo Place, S.W.
Oakley, John...10, Waterloo Place, S.W.
Odams, James...109, Fenchurch Street, E.C.
Owens, Samuel...Whitefriars Street, E.C.
Palmer, Ralph C....8, Old Burlington Street, W.
†Parkinson, John...31, Great St. Helen's, E.C.
†Pelly, Sir H. C., Bart., M.P....46, Grosvenor Gardens, S.W.
Perkins, Loftus...6, Seaford St., Regent Square, W.C.
Perkins, W. H....65, Sutherland Gardens, W.
113, Sir T. Erskine, Bart....36, Eaton Place, S.W.
†Peto, Sir Morton, Bart....9, Victoria Chambers, Victoria Street, S.W.
Phillips, H. R....Willesden Paddocks, Kilburn
Phillips, Maj.-Gen. Sir T.....Senior United Service Club, S.W.
Phillips, T. E....Heston, W.
†Phillpotts, Thomas...Junior Carlton Club, S.W.
†Phillpotts, Thomas, jun...Junior Carlton Club, S.W.
†Pickford, W....148½, Fenchurch Street, E.C.
Pilgrim, C. H....Virginia Water, Staines
Pole, Sir Van Notten P., Bt...59, Gloucester Pl., W.
Powis, Charles...60, Gracechurch Street, E.C.
Pritchard, William...Royal Veterinary Col., N.W.
Proctor, M. M....49, Thornhill Square, Barnsbury
Purser, Edward...116, Fenchurch Street, E.C.
Randolph, Lieut. Col....76, Chester Square, S.W.
†Rivington, Harry...22, Finsbury Square, E.C.
Robinson, Sir J. S., Bart....20, Park Lane, W.
†Roebuck, J. A....19, Ashley Pl., Victoria St., S.W.
Rose, Philip...1, Cromwell Road, South Kensington
Rotton, Richard...3, Boltons, Brompton, S.W.
†Rucker, Martin D....115, Leadenhall Street, E.C.
Sainsbury, Edward...16, Mark Lane, E.C.
Sanderson, James...11, Pall Mall East, S.W.
†Sandford, G. M. W., M.P....33, Hertford St., May Fair, W.
†Schwann, F. S...2, Prince Arthur Road, Hampstead
Scott, Col. the Hon. C. G....79, Eaton Square, S.W.
Scott, Louis Guy...79, Eaton Square, S.W.
Scott, T. C...King's Arms Yard, Moorgate St., E.C.
Shackle, Thomas...Hayes, Uxbridge
Shaw, C. H....1, Plowden Buildings, E.C.
†Sherborn, Francis...Bedfont, Hounslow
Simpson, A...Chiswell Street, E.C.
†Simpson, Pinder...31, Savile Row, W.
Sladen, D. B.... 2, King's Arms Yard, E.C.
Sladen, St. Barbe...1, Delahay Street, S.W.
†Smith, Edward J....16, Whitehall Place, S.W.
Smith, Henry Herbert...West End, Hampstead
†Smith, J. Heseltine... 24, Essex St., Strand, W.C.
Smith, M. T....13, Upper Belgrave Street, S.W.
Smith, R. B....Huxley Farm, Edmonton
Smith, Thomas...34, London Street, Fitzroy Sq., W.
Soames, D. W....Harrow Weald, Stanmore
Spencer, John...37, King William Street, E.C.
Squire, William...5, Coleman Street, E.C.
†Stanley, E. J....14, Grosvenor Square, W.
Stanley, W. H. Sloane...21, Curzon Street, W.
†Stephens, J....7, Westbourne Crescent, W.
Stevens, W. Carr...33, Mark Lane, E.C.
†Stirling, John...17, Ennismore Gardens, W.
Stocker, J. P....93, Oxford Terrace, W,
Strafford, Henry...13, Euston Square, N.W.
Talbot, Hon. Col. W. P....Oakington, Harrow
Tattersall, Edmund...Albert Gate, S.W.
Taylor, James...Farmers' Club, Adelphi, W.C.
Taylor, J. Wells...Chester Terrace, Regent's Pk., W.
†Taylor, Richard...6, Gledhow Gardens, South Kensington
†Tempest, Sir C. H., Bt...15, Upper Grosvenor St., W.
Thackeray, Capt...Junior United Service Club, S.W.
Thompson, Major..Nottingham Place, Regent's Park
Thornhill, W. C. Clarke...Ickenham, Uxbridge
†Thornton, John...7, Princes Street, W.
Thynne, F. G....11, Great George Street, S.W.
Tillyer, Richard H....Heathrow, Hounslow
Tisdall, E. C...Holland Park Farm, Kensington, S.
†Tollemache, H. B...Junior United Service Club, S.W.
†Tomline, Colonel G...1, Carlton House Terrace, S.W.
Tompson, E. C. S....Dromenagh, Iver, Uxbridge

†Tooke, Rev. J. T. H....University Club, Suffolk Street, S.W.
†Tuckett, P. D., jun....10A, Old Broad Street, E.C.
Tuson, R. V....Royal Veterinary College, N.W.
†Tyler, Sir James...Pine House, Holloway, N.W.
†Underwood, Joseph...5, Hyde Park Gardens, W.
Unite, John...291, Edgware Road, W.
Valpy, Richard...5, Rutland Gate, S.W.
†Veitch, H. J....Exotic Nurseries, Chelsea
†Wade, Richard...13, Seymour Street, W.
Wainwright, C. J....251, High Holborn, W.C.
†Walker, John L...71, Oxford Terrace, Hyde Pk., W.
Wall, T. Senior...120, Maida Vale, W.
Warner, Robert...8, The Crescent, Cripplegate, E.C.
Weatherby, James...6, Burlington Street, W.
†Webster, Charles...Cowley, Uxbridge
Welch, Alfred...Southall
†Wells, G. G....Junior United Service Club, S.W.
Wemyss, M. W....25, Regent's Park Road, N.W.
†Whitbread, S. C....49, St. George's Square, S.W.
White, Arnold W....12, Great Marlborough St., W.
†Whitehead, Jeffery...39, Throgmorton Street, E.C.
†Wicks, John...33, St. Luke's Road, W.
Wing, T. Twining...17, Woburn Square, W.C.
Withers, S. H....242, Oxford Street, W.
Wolverton, Lord...Stanmore Park
Wood, Henry...19, Hanover Terrace, Regent's Park
Wood, Walter A....36, Worship Street, E.C.
†Wrench, Robert...39, King William Street, E.C.
Wright, W. P....36, Phillimore Gardens, Kensington
†Wyndham, Hon. P., M.P....44, Belgrave Sq., S.W.
†Young, G.....5, Lime Street, E.C.

MONMOUTHSHIRE.

Members.

†Bailey, Crawshay...Maindiff Court, Abergavenny
Batchelor, T. B....Maindee, Newport
†Berrington, Arthur D....Pant-y-Goitre, Newport
Brewer, Tom Llewelyn...Dany Graig, Newport
†Cartwright, William G., M.A....Newport
Cartwright, William S....Stow House, Newport
Chandler, Charles T....Hay-gate, Chepstow
†Cooke, Thomas Eborall...Newport
Earnshaw, H. G....Court St. Lawrence, Monmouth
Evans, Warren...Llandowlais, Usk
†Evans, William...The Fields, Newport
Firbank, Joseph...Newport
Fothergill, W....Cefnrhychdir, Tredegar
†Fox, Charles B....Malpas, Newport
†Fryer, Henry C....Lodge Park, Glandovey, Aberystwith
Graham, W., jun....Newport
Graham, W. Benjamin...Maindee, Newport
Gratrex, Thomas...Farm Wood, Newport
Harrhy, David...Newport
Herbert, Major Edmund...Llansantffraed, Abergavenny
Hewertson, Nelson...Newport
Holehouse, John...Gaer Hill, Chepstow
Homfray, Lorenzo A....Woodlands, Newport
Homfray, S....Glenuske Park, Caerleon, Newport
Homfray, W. H. W....Glenuske, Caerleon, Newport
†Howells, John Lewis...Blackwood, Monmouth
Hughes, Captain J. G. P....Allt Lloyd, Aberystwith
Jones, John...Pant-y-Goitre, Abergavenny
Lewis, T. F....Newport
Lister, Edward...Cefn Ila, Usk
†Mitchell, F. J...Llanfrechfa Grange, Caerleon, Newport
Morgan, Roger...Llanellan, Abergavenny
Nelmes, W....Pembridge Castle, Monmouth
Parsons, Valentine...Slough, Chepstow
†Peacock, T. K....Ruperra Castle, Newport
Phillips, C....93, Commercial Street, Newport
Phillips, C. David...Newport
Price, Henry...Undy, Newport
Price, W....New House, Caerleon, Newport
Pybus, John...Court Farm, Magor, Chepstow
Raglan, Lord...Cefntilla House, Usk
Rees, W. G....Bryn Hedydd, Newport
Rees, W. Traharne...Holly House, Newport
Relph, G. R. Greenhow...Beech Hill, Usk
†Rolls, J. Allan...The Hendre, Monmouth
†Roper, Richard S....Newport
Stone, J. J....Scyborwen, Langibby, Newport
Stone, John S....Newport
†Stratton, R....The Duffryn, Newport
Tucker, Edwin...Frogmore Street, Abergavenny
†Tyler, Capt. G. G.....The Callow Hill, Monmouth
Williams, Rev. E. Turberville...Caldicot, Chepstow
Williams, Lewis...Redwick House, Chepstow
Woodall, Thomas...Dinham, Chepstow

NORFOLK.

Governors.

Wales, H.R.H. the Prince of, K.G....Sandringham
Buxton, Sir R. Jacob, Bt....Shadwell Court, Thetford.
†Leicester, Earl of...Holkham Hall
Stafford, Lord...Cossey Hall, Norwich
Suffield, Lord...Gunton Park, Norwich

Members.

Aldous, James Arthur...Lingwood, Norwich
Allen, Rev. Dr...Shouldham Hall, Downham Market
Allen, Thomas...Marks Hall, Norwich
†Amhurst, W. A. T....Didlington Park, Brandon
†Angerstein, W....Weeting Hall, Brandon
Anthony, John...Fincham, Downham Market
Applegate, T. W....Tittleshall, Swaffham
†Applewhaite, E....Pickenham Hall, Swaffham
†Atkinson, C....Swanton Novers, East Dereham
†Aylmer, Hugh...West Dereham, Stoke Ferry
†Aylmer, John B....Fincham Hall, Downham
†Aylmer, Robert B....Westacre Abbey, Swaffham
†Back, J. A...The Old Hall, Hethersett, Wymondham
Ba[illegible]on, James...Attleborough
Baker, Wm. E....Tilney All Saints, King's Lynn
Baker, Wm. P....Phœnix Works, King's Lynn

Barber, John Lee...Raveningham Hall, Loddon, Norwich
Barnard, Charles...Norwich
Bate, William...Thimpling, Scole
Bately, S. S....Southtown Road, Great Yarmouth
Bayning, Lady...Honingham Hall, Norwich
Beart, Charles...Stow Bardolph, Downham
Beart, Walter John...King's Lynn
Beauchamp, Sir T. W. P., Bt..Langley Hall, Norwich
Beck, Edmund...Sandringham, King's Lynn
Bidwell, Thomas S....Thetford
Birbeck, Edward...Horstead Hall, Norwich
†Birch, Wyrley...Wrotham Hall, Thetford
†Bircham, William G...Dunton, Fakenham
†Bird, Rev. J. Waller...Foulsham Rectory
†Birkbeck, Henry...Norwich
Bishop, John...3, The Walk, Market Place, Norwich
Blake, Francis John...Norwich
Blyth, D'Urban...Great Massingham, Rougham
†Blyth, James...Weasenham All Saints, Brandon
†Bonner, Henry C....East Rudham, Rougham
Booth, Nathan, jun....North Delph, Downham
Boucher, C....Burgh Hall, Hevingham, Norwich
Boulton, W. S....Rose Lane, Norwich
Boyce, John...St. Giles' Road, Norwich
Brackenbury, W. T...Shouldham Thorpe, Downham
†Branford, Womach...Godwick, Swaffham
Brereton, Rev. J. L...Little Massingham, Rougham
†Brown, Thomas...Marham, Downham Market
Browne, R. C....Elsing, East Dereham
†Budd, Thomas W....Shropham Hall, Thetford
Bullard, Dick...Tunstall, Acle
Bullard, Harry...Hellesdon, Norwich
Bulwer, William E. Lytton...Heydon Hall, Reepham
†Burrell, Charles...Thetford
†Bygott, Robert...North Creake, Fakenham
Cann, John...Wymondham
Case, James...Cockthorpe, Wells
†Case, James P....Testerton, Fakenham
Case, Thomas H....Testerton Hall, Fakenham
Case, William...Tuttington, Hevingham
†Cator, Albemarle...Woodbastwick Hall, Norwich
Chambers, Thomas, jun....Colkirk Hall, Fakenham
Childs, Henry...East Winch, King's Lynn
Clarke, William R....Wattlefield Hall, Wymondham
Cobon, James...Well Hall, King's Lynn
Coldham, H. J....Anmer Hall, King's Lynn
Colman, J. James, M.P....Carrow House, Norwich
Colman, Samuel...Willy Hall, Attleborough
Colman, T. H....Rockland St. Peter, Attleborough
Cook, Charles C....Litcham, Swaffham
Cooke, Frederick J....Caston Hall, Attleborough
Copeman, George...Dunham Lodge, Swaffham
Crawshay, Charles...Hingham, Attleborough
Cronshey, James...Thetford
Crowe, Edmund...Denver, Downham Market
Cresswell, Mrs. Gerard...Appleton Hall, King's Lynn
Crickmore, William...Seething, Brooke
Crowe, Daniel...Gaywood, King's Lynn
Cubitt, Elmer...Bintry, East Dereham
Cubitt, George...North Walsham
Custance, Hambleton, F....Weston House, Norwich,
Davey, John G. Ellis...Horningtoft, Elmham
Day, Gerard J....Horsford House, Norwich
†Dewing, R....Carbooke, Watton, Norfolk
Digby, Rev. K....Tetteshall Rectory, Litcham
Dodman, Alfred...King's Lynn
Durrant, G....Redenhall Grange, Harleston
Dutchman, Durrant...Swaffham, Brandon
†Eaton, George...Spixworth, Norwich
Elliot, Thomas J....Langley Park, Norwich
†Ellis, John B., jun....West Barsham, Fakenham
Elwes, Hugh W. H....Earsham (Bungay).
England, George...Freethorpe, Acle
England, Richard...Binham, Wells
†Everington, W. D....Dillington Hall, East Dereham
Everitt, Thomas...North Creake, Fakenham
Ewen, Major C. J....Marlingford Hall, Norwich
†Farrer, Edmund...Sporle, Swaffham
Farrow, Charles...Diss
Fellowes, Robert...Shotesham Park, Norwich
Fellowes, Rev. T. L....The Vicarage, Honingham
Fergusson, John...Brettenham Manor, Thetford
†Ffolkes, George B...Cougham Lodge, King's Lynn
Finch, Jacob...Swaff ham
Fison, Cornell....Ford Place, Thetford
†Fison, Cornell Henry....Thetford
Fitzroy, Lieut.-Col. H....Stratton Strawless, Norwich
Freeman, John T....Saham Grove, Shipdham, Thetford
Freeman, Joshua...Dersingham, King's Lynn
†Frere, G. Edward...Roydon Hall, Diss
Fulcher, Thomas...Elmham Hall, Dereham
Gayford, E. J....Syderstone, Fakenham
Gayford, Thomas...Hargham, Attleborough
†Gilbert, R....Ashby Hall, Berghapton, Norwich
†Gilbert, William A....Cantley, Acle
Giles, Henry...Croxton Park, Thetford
Gilbert, T. Denny...Cantley, Norwich
Gostling, T. P....Diss
Gowing, George...Hellesdon, Norwich
Green, Edmund...King's Lynn
†Griggs, James...South Creake, Fakenham
†Gurdon, Brampton...Letton Hall, Shipdham
†Gurney, John H....North Repps, Norwich
Hammond, John...Bale, Thetford
†Hamond, Anthony...Westacre, Brandon
†Hamond, Washington...Pensthorpe, Fakenham
Harbord, Hon. H....Gunton Park, Norwich
†Hardy, W. H. C....Letheringsett Hall, Holt
Hare, Sir T., Bart....Stow Hall, Downham Market
Harlock, Henry...Feltwell Grange, Brandon
†Harrison, Harris...West Lexham, Castleacre
Heath, William...Ludham Hall, Norwich
Helsham, Gustavus...St. Mary's Hall, King's Lynn
Hickling, J. S....Cawston, Norwich
Hoff, William J....Wormegay, King's Lynn
Holditch, George...King's Lynn
†Holmes, Gervas...Brockdish Hall, Scole
Holmes, John...Globe Lane, Norwich
Howes, James...Chapel Field, Norwich
†Hudson, T. Moore...Castleacre, Brandon
Ives, Robert...Calthorpe, Hanworth
Jones, George...Stow, Downham Market
†Jones, Sir W., Bart....Cranmer Hall, Fakenham
Kendle, Robert J....Weasenton, Brandon

Keppel, Rev. W. A. W....Haynford, Norwich
Kent, Edmund, jun....Dunton, Fakenham
†Kimberley, Earl...Kimberley, Wymondham
†King, John L....Thorpe Abbots, Scole Inn
Larkman, Robert...Belton Hall, Great Yarmouth
†Leeds, Robert...Wicken Farm, Castleacre, Brandon
Leeds, Stephen...Whitwell, Reepham
Lee-Warner, H. J...Walsingham Abbey, Fakenham
†Le Strange, H....Hunstanton, King's Lynn
†Lombe, Rev. H. E...Melton Hall, Wymondham
†Long, Kellett...Dunston Hall, Norwich
Low, Frederick...Norwich
Lucas, George...Filby House, Norwich
Mackenzie, Edward P....Downham Hall, Brandon
Mann, John...Thornage, Thetford
Marriott, J. Lewis...Narborough, Brandon
Marsters, Charles...Saddlebow, King's Lynn
†Mason, Claxton B....Beechamwell, Swaffham
†Matthews, T....Newton, Castleacre, Brandon
†Micklethwaite, Rev. J....Taverham Hall, Norwich
†Middleton, Charles...Holkham
†Middleton, E. P....Hindringham Hall, Walsingham
Middleton, W. W....Flitcham Abbey, King's Lynn
†Moore, T. William...Warham, Wells
Murton, Thomas...Kenninghall, Thetford
Nicholson, G. M....Brisley, Swaffham
†Norris, William...Wood Norton, Dereham
North, Charles...The Hall, Rougham
†Oldfield, Edmund...Fouldon Hall, Brandon
†Overman, Henry R....Weasenham, Fakenham
†Overman, John...Burnham Sutton
†Overman, Robert...Edgmere, Walsingham
Palmer, Leonard J....Snetterton, Thetford
Parker, Hastings...Dudwick House, Buxton
Peacocke, W. C....South Hilgay, Downham
Platten, Rev. J. C....North Barsham, Fakenham
†Read, Clare S., M.P...Honingham Thorpe, Norwich
†Read, G., jun....Barton Hall, Brandon
Reeve, James...Snetterton Hall, Thetford
Rinder, Joseph...Bowthorpe Hall, Norwich
Ringer, John...West Harling
†Ringer, T. F....Brancaster, Lynn
Rising, Robert...Horsey, Great Yarmouth
Rix, G....Gayton Thorpe, King's Lynn
Rose, Thomas...Melton Magna, Wymondham
Rous, Hon. W. Rufus...Worsted House, Norwich
Rowell, John...Crabbs Abbey, Downham Market
Sapwell, Benjamin B....Aylsham
Savage, Frederick...King's Lynn
†Scott-Chad, Joseph S....Thursford Hall, East Dereham
Seago, Jeremiah...Stoke Holy Cross, Norwich
Seppings, T. J... Wormegay Grange, King's Lynn
Shacklady, W. B....Taverham, Norwich
Sharman, John W...Hempton Abbey, Fakenham
Shellabear, Samuel...Holkham, Wells
Sheringham, H. V....South Creake, Fakenham
Slator, John W....King's Lynn
Smith, George J....Great Melton, Norwich
Smith, John C....Kimberley, Wymondham
Smith, Richard...Kimberley, Wymondham
Smith, William...Dickleburgh, Scole
Stebbing, Henry...Stow Bedon Hall, Attleborough
†Stracey, Sir H. J., Bart., M.P....Rackheath Hall, Norwich
Stroyan, Robert....Brixley, Norwich
†Stuart, J. Windsor...Raynham Hall, Brandon
Sumner, Rev. C. V. H....The Paddock, Swaffham
Tallent, Herbert...Bylaugh, Dereham
Taylor, Alfred...Starston Place, Harleston
Taylor, Garrett...Easton, Norwich
Tayton, William...Syderstone, Fakenham
Thorn, Charles...St. Giles Gate, Norwich
†Thornhill, Thomas...Riddlesworth Hall, Thetford
†Thornton, Thomas...Wereham, Stoke Ferry
†Turnbull, Rev. T. Smith...Blofield
Upcher, Henry R....Sherringham Hall, Cromer
Varnell, G. W...Beech House, Belton, Gt. Yarmouth
Villebois, Henry...Marham, Downham Market
Waite, J. N...Bramerton, Norwich
†Walsingham, Lord...Merton Hall, Thetford
Watling, R. S....Scratby Hall, Great Yarmouth
Welcher, William...Thetford
†Wellingham, John...East Walton, Lynn
Whisler, Henry....Great Massingham, Rougham
Wigg, Grigson H....Swanton Morley, East Dereham
Winearls, Henry...Westacre, Brandon
Winearls, Robert C....Marham, Downham Market
Winter, Ambrose, jun....Lenwade Mills, Norwich
Woods, Henry....Merton, Thetford
Wright, Robert J....Queen Street, Norwich
†Wright, Thomas...North Runcton, Lynn
Wright, W. J....Fring, King's Lynn
†Youngman, J. W....Westacre, Brandon

NORTHAMPTONSHIRE.

Governors.

Loder, Robert...Whittlebury, Towcester
Spencer, Earl, K.G....Althorpe Park, Northampton
Wells, William...Holmwood, Peterborough

Members.

Arthur, Col. Charles...Desborough (Market Harborough)
Ball, William...Rothwell, Kettering
Barford, William...Peterborough
Bayes, Charles...Kettering
Beecroft, John...Eye, Peterborough
†Beasley, J. Noble.. Pitsford Hall, Northampton
†Bennett, B. F....Marston Trussell (Theddingworth)
Berridge, Samuel...Croughton, Brackley
Bird, John, jun....Farset, Peterborough
Boyer, William...Cottesbrook, Northampton
Branson, William C....Little Weldon, Wansford
†Burdett, E...Manor Farm, Lyveden, Thrapstone
Cantley, Rev. J....Thorney, Peterborough
†Cartwright, T. L. M....Newbottle, Brackley
Carysfort, Earl of...Elton, Peterborough
Clarke, John G....Brackley
Clarke, John S....Bramston House, Oundle
Cooch, Mrs....Harleston, Northampton

Core, John...Peterborough
Core, William...Flitton Lodge, Peterborough
Dalton, Rev. R....Kelmarsh, Northampton
Davison, John Perry...Easton Maudit, Northampton
Eden, F. Morton...Boughton House, Kettering
†Edwards, C. Bidwell...Minster Close, Peterborough
Edwards, T. F....Tanholt Farm, Eye, Peterborough
Faulkner, William...Rothersthorpe, Northampton
†Fitzwilliam, Hon. C. W., M.P..Alwalton, Peterboro'
Garratt, R. Lancefield...Thorpe Malsor, Kettering
†Gordon, Lord Esmé S....Castor House, Peterborough
Gordon, Francis...Thornhaugh, Wansford
Griffin, C. W....Werrington, Peterborough
Griffin, Robert H....Boro' Fen, Peterborough
Harrison, Rev. J. H....Bugbrook, Weedon
Harrison, William H....Oxenden, Market Harboro'
Hensman, H. D....Duston Lodge, Northampton
†Hewitt, Robert H....Dodford, Weedon
Hopkinson, John...Dogsthorpe, Peterborough
Horrell, Harry...Thorney Abbey, Peterborough
Huntley, Marquis of...Orton Hall, Peterborough
Isham, Sir C. E. Bart....Lamport Hall, Northampton
Isham, Rev. Robt....Lamport Rectory, Northampton
Jeyes, Francis C....Brixworth
†King, George.. East Haddon, Northampton
†Langham, H. H....Cottesbrook Park, Northampton
†Lenton, William, jun....Oundle
Little, George...Farcet, Peterborough
Little, Henry...Boroughbury House, Peterborough
Lovell, John M....Harpole, Weedon
†Lynes, G. Boulton...Eastcote, Towester
Lyveden, Lord...Laundemer, Oundle
Mackinder, Joseph...Peterborough
Manning, John...Orlingbury, Wellingborough
†Mason Frederick...Wansford, Peterborough
Mawer, E....Wyrdelands, Thorney, Peterborough
Maxwell, G. S....Fletton Lodge, Peterborough
Maxwell, W. G....Orton Longueville, Peterborough
†Monckton, E. H. C....Fineshade Abbey
Montgomery, Rev. R....Milton, Northampton
Moore, J. W....Sexton Barns Farm, Peterborough
Moore, W. G....Eye, Peterborough
†Nethercote, H. O...Moulton Grange, Northampton
Nisbet, R. P....Thorney, Peterborough
Oldham, T. E....Loddington Hall, Kettering
†Oliver, John...Oxenden, Northampton
Oliver, Robert E... Sholbrooke Lodge, Towcester
†Osborn, George...Pattishall, Towcester
Peach, Edward...Oundle.
†Pell, A., M.P....Hazlebeach, Northampton
Pentelow, John...Rounds, Thrapston
†Perceval, Charles...West Haddon
Perkins, W....Singlesole, Thorney, Peterborough
†Phipps, P., M.P... Collingtree Grange, Northampton
Potterton, W. H....Boughton Grange, Northampton
Prior, George T....Wigsthorpe, Oundle
Rooke, John...Weldon Grange, Wansford
Roughton, James J....Kettering
Rowell, William.. Peterborough
Sartoris, Frederick..Rushden Hall, Higham Ferrers
†Scriven, Charles H....Castle Ashby, Northampton
Scriven, George...Harpole, Weedon
Scriven, G. W...Castle Ashby, Northampton
†Scriven, Richard George...Castle Ashby, Northampton
Sharp, Francis B....Finedon, Wellingborough
Simpkin, B....Fotheringay, Oundle
Singleton, E....Preston Deanery, Northampton
Slater, John...Orton Longueville, Peterborough
Smith, William...Kettering
Southam, Henry...Stibbington, Wansford
Storer, Rev. J....Hellidon, Daventry
†Stratton, J. Locke....Turveston House, Brackley
Strong, C. Isham...Thorpe Hall, Peterborough
Thorp, Thomas...Little Gidding, Oundle
†Tibbits, Captain...Barton Seagrave, Kettering
Topham, Joseph...Thorney Park, Peterborough
†Tryon, Thomas...Bulwick, Wansford
Turner, George, jun....Thorpelands, Northampton
Wallis, Samuel...Barton Seagrave, Kettering
†Wartnaby, John R....Clipston
Warwick, R. D....Stanground, Peterborough
Waters, Richard...Charwelton House, Daventry
†Westmoreland, Earl of...Apthorpe, Wandsford
Whitehead, William...Wollaston, Wellingborough
†Whitting, William...Thorney, Peterborough
Whitton, J. W....Potcote, Towcester
Whitworth, H. B....Northampton
Wilkinson, J. Rennie...Great Addington, Thrapstone
Willows, J. G....Rushton, Kettering
Willson, Thomas...Biggin Grange, Oundle
Wilson, John...2, Albion Place, Northampton
†Wood, Rowland...Clapton, Thrapston
Wood, T. Roe...Northampton
Youmans, Richard...Badby, Daventry
Young, A. A....Orlingbury House, Wellingborough

NORTHUMBERLAND.

Governors.

†Browne, Alex. Henry...Doxford, Chathill
†Grey, Earl...Hawick House, Alnwick
Ridley, Sir M. White, Bart....Blagdon, Cramlington

Members.

†Anderson, Robert...Grey Street, Newcastle
Angus, George...Benwell Grange, Newcastle
†Angus, John...Whitefield, Morpeth
Arkle, Thomas...Highlaws, Morpeth
Armstrong, John A....Bay's Leap, Wylam
Armstrong, T. J....5, Hawthorn Terrace, Newcastle
†Atkinson, J. H. H....Angerton, Morpeth
Balleny, C. D. W....Red Barns, Newcastle
†Beaumont, W. B., M.P....Bywell Hall, Newcastle
Bell, Captain H....Wolsington, Newcastle
Bell, Robert...Newcastle
Bell, William...Cramlington
†Benson, William...Allerwash House, Hexham
Blackett, Sir E., Bart....Matfen, Newcastle
Blandford, Thomas...Corbridge
†Bolam, Robert G....Weetwood Hall, Wooler

Bolam, W. T....Jesmond Gardens, Newcastle
Bosanquet, Rev. R. W....Roch, Alnwick
Brown, Rev. L. D....Unthank Hall, Haltwhistle
Burdon, George....Heddon House, Newcastle
†Cecil, Lord A....Woodhouse Manor, Morpeth
†Cecil, Lord L....Woodhouse Manor, Morpeth
Charlton, W. H....Hesleyside, Bellingham
†Chrisp, John...Doxford, Chathill.
Clayton, John...Newcastle
†Clutterbuck, T....Warkworth, Acklington
Cockburn, G....Summerhill Grove, Newcastle
Cresswell, A. J. Baker...Cresswell, Morpeth
†Crossly, Clement...East Learmouth, Cornhill
Culley, George...Fowberry Tower, Belford
†Cuthbert, William...Beaufront, Hexham
†Dees, R. Richardson...Wallsend Hall, Newcastle
Dickinson, G. T....Wheelbirks, Stocksfield
†Dinning, John....Adderstone, Belford
†Dixon, John Thomas...Walwick Grange, Hexham
Dods, T. P....St. Helen's, Hexham
Donkin, Samuel...Bywell, Felton
Dryden, Thomas...Moss Kennels, Haydon Bridge
Embleton, Robert...Backworth, Newcastle
†Errington, Rowland...Sandon, Hexham
Farley, S. L....38, Sandhill, Newcastle
Fawcus, John...South Charlton, Chathill
Fenwick, G. A....The Bank, Newcastle
Finney, Samuel...13, Postern, Newcastle
†Gibson, J....Guns Green Hill, Ayton, Berwick
Goddard, H. R....Belsay, Newcastle
Gray, Thomas...Clayton Street West, Newcastle
†Grey, Rt. Hon. Sir G. Bt....Fallowdon, Alnwick
Hamond, Charles F., M.P....Newcastle
†Harle, John Joseph...Mill Hills, Haydon Bridge
Harrett, Robert...Kirkwhelpington, Newcastle
Hawthorn, William...Benwell Cottage, Newcastle
Hedley, Thomas...Cox Lodge, Newcastle
Henderson, William...Fowberry Mains, Belford
Hodgson, Richard...Crofton Mills, Blyth
Hogg, James...Buckton, Belford
Hudspith, William...Brookside, Haltwhistle
Huggup, James...West Sleekburn, Bedlington
James, Thomas...Otterburn Castle, Newcastle
Jobson, William...Westmorland Road, Newcastle
Joicey, Edward...Newcastle
Joicey, John...Newton Hall, Stocksfield
King, R. H....Warkworth, Acklington
Kirsopp, Rev. F....Burn Brae House, Hexham
Kirsopp, James...The Spital, Hexham
Langdale, Sampson...Espley House, Morpeth
Lawson, E....Redesdale Cottage, Newcastle
Lawson, Rev. E...Longhurst Hall, Morpeth
Laycock, Joseph...Low Gosforth, Newcastle
Lee, J. Bunting...Stocksfield Hall
Lee, Joseph...Dilston, Corbridge
Lennox, William...Six Mile Bridge, Newcastle
Logan, John W....Tweedmouth, Berwick
Loraine, Edward...The Riding, Riding Mill Station
Matthews, John, M.D....Tynemouth
†Northumberland, Duke of...Alnwick Castle
Ord, Rev. J. A. Blackett...Whitfield Hall, Haydon Bridge
Ormston, Robert...Newcastle
†Oswell, W. B....Eardiston House, West Felton
Palmer, C. Mark, M.P....Newcastle-on-Tyne
Ramsay, G. H....Derwent Villa, Newcastle
Rea, Charles...Doddington, Wooler
†Richardson, C. T....Monkton Lodge, Jarrow-on-Tyne
†Richardson, E....22, Ridley Place, Newcastle
†Riddell, H. B....Rothbury, Morpeth
Riddell, John...St. Ninians, Wooler
†Riddell, Sir W. B., Bart...Hepple, Rothbury, Morpeth
Ridley, John M....Walwick Hall, Humshaugh
†Ridley, M. White, M.P....Blagdon, Cramlington
Ridley, Thomas...Parkend, Wark
†Robson, John...Byrness, Rochester
Sanderson, R. Burdon...North Jesmond, Newcastle
Scott, Joseph...Jesmond Road, Newcastle
†Snowball, F. J....Seaton Burn House, Cramlington
Spencer, John...Whorlton Hall, Newcastle
†Spencer, J. Watson...Whorlton Hall, Newcastle
†Spencer, Michael...Lemington Hall, Blaydon
†Spencer, Thomas...Ryton, Newcastle
Spraggon, Benjamin...Nafferton, Stocksfield
†Stephenson, Clement...Newcastle
Stephenson, Hugh...Dene House, Newcastle
Straker, Henry...Dipton House, Riding Mill
†Surtees, Villiers C. V....Newcastle
Swan, Joseph...3, Carlton Place, Newcastle
Swan, Mark...Lesbury, Bilton
Swan, W. Robert...Wallsend, Newcastle
Swann, John...Bedlington, Morpeth
†Swinburne, Sir John, Bt....Capheaton, Newcastle
†Tate, John...Barnhill, Acklington
†Thew, Edward...Lesbury House, Alnwick
Thew, Frederick...Shortridge, Bilton
†Thompson, Alexander...Kirknewton, Wooler
Trevelyan, Sir W. C., Bart....Wallington, Newcastle
Turnbull, George...Tughall House, Chathill
†Waddilove, G. M. D....Brunton House, Hexham
†Wallis, Owen...Bradley Hall, Blaydon
Wallis, Robert...Stocksfield
Watson, John E....Newcastle
Wigham, George...Laverick Hall, Cramlington
Wilson, Jacob...Woodhorn Manor House, Morpeth
†Wilson, Thomas...Shotley Hall, Newcastle
Woods, J. A....Benton Hall, Newcastle
†Wright, T. Irwin...Seaton Burn House, Dudley

NOTTINGHAMSHIRE.

Governors.

Barrow, W. Hodgson, M.P....Southwell
†Brown, James...Rossington, Bawtry
†Manvers, Earl...Thoresby Park, Ollerton, Newark
Milward, Richard...Thurgarton Priory, Southwell
†Sutton, John Manners...Kelham, Newark

Members.

Adams, James...The Fallowes, Oxton, Southwell
Allcock, Thomas...Radcliffe-on-Trent
Arnall, W. S....Sutton, Elton

†Baily, John, jun....Python Hill, Mansfield
Baker, Robert...Gamston, East Retford
Bansor, John...Carrington, Nottingham
†Bayley, T. Harvey D....Edwinstowe, Ollerton
†Beaumont, G., jun....Bridgford Hill, Nottingham
Beevor, Henry...Blyth, Worksop
Bingley, Charles...Langeld Farm, Worksop
Bingley, Joseph...Beckingham (Gainsborough)
Blackwell, Richard...Goldhill Farm, Southwell
Brett, John...Oxton Grange, Southwell
Brodhurst, Lucas...Upton, Southwell
Bullen, E. J....Norwood Farm, Southwell
Burnell, E. P....Winkburne Hall, Southwell
Cane, Rev. T. C....Brackenhurst, Southwell
Carding, F....Combs Farm, Farnsfield, Southwell
†Cartwright, T. W...Ragnall Hall, Newton, Newark
Chambers, John E. F....Mansfield, Woodhouse
Charles, Edward...Bulwell
Cheetham, Henry...Woodthorpe, Nottingham
Cookson, W. J....Worksop Manor, Worksop
†Crawhall, George...West Bank, Mansfield
Cripwell, John...Carlton, Nottingham
Cripwell, William...Mansfield, Woodhouse
†Edge, James Thomas...Strelley Hall, Nottingham
Esam, William...Averham Park, Southwell
Faulconbridge, W. F....Bestwood Park, Bulwell
Faulks, Michael...Colston Basset, Bingham
Field, Samuel...Farnsfield, Southwell
Flower, Henry V....Scarrington, Whatton
†Foljambe, Francis J. S., M.P....Osberton House, Worksop
†Francklin, J. L....Gonalstone Hall, Nottingham
†Galway, Viscount, M.P....Serlby Hall, Bawtry
Gelsthorpe, Thomas...Morton Manor, Newark
Gilbert, Henry...Barnby Manor, Newark
Godber, Samuel...Balderton, Newark
†Greenfield, George...Belle Eau Park, Ollerton
Grundy, George...Tortworth, Bawtry
Hall, Francis...Park Hall, Mansfield
†Hall, Marriott...Thorpe Salvin, Worksop
†Hammersley, W....Parkinson Street, Nottingham
†Hassall, G....Shelford Manor, Radcliffe-on-Trent
†Hemsley, John...Shelton, Newark
Heslop, Rev. Gordon...Cossall, Nottingham
†Hildyard, T. B. T., M.P....Flintham, Newark
Hodgkinson, Enoch...Morton Grange, Retford
†Hodgkinson, Frank...Kirkby Hardwick, Sutton-in-Ashfield
†Hodgkinson, G....Kirkby-in-Ashfield, Nottingham
Hodgkinson, Grosvenor...Newark
Holden, Atkinson...Nuttall, Nottingham
Hole, James...Muskham Woodhouse, Newark
Hopkinson, Charles...Retford
†Horncastle, Henry...Edwinstowe, Ollerton
†Huntsman, Benjamin...West Retford
†Huskinson, Thomas...Epperstone, Southwell
†Johnson, George...Blaco Hill, Retford
Jalland, J. Foster...Widmerpool, Nottingham
Kelham, Robert...Bleasby Hall, Southwell
Kenrick, George...Thurgarton Hill, Southwell
Knight, W. E....14, Carter Gate, Newark
Lamin, John...Bestwood Park, Nottingham
Lester, F..Upper Morton Grange, Babworth, Retford
Lindley, Urban...Radmanthwaite House, Mansfield
Lowe, Robert N....Bassingfield, Nottingham
†Machin, J. Vessey...Gateford Hall, Worksop
March, John...Scarrington, Whatton
Martin, H. B....Colston Bassett, Bingham
Moore, John...Calverton
†Munk, Harry...Holmepierrepont
†Musters, John C....Annesley Park, Linby
†Nall, Joseph...Papplewick, Nottingham
Naylor, G. B....Scaftworth, Bawtry
Neale, Charles...Newfield, Screveton, Bingham
Neale, Charles J....Mansfield
†Nevile, Rev. C....Thorney, Newark
†Nevile, George...Shebton, Newark
New, David...Waverley House, Nottingham
Nicholsen, W. N....Newark-on-Trent
Paddison, Charles F....Stableford, Newark
Paget, Charles...Ruddington Grange, Nottingham
†Paget, Joseph...Stuffyn Wood Hall, Mansfield
Painter, John...Forest Road, Nottingham
Park, Fergus W....Grove, Retford
Parke, William...Stragglethorpe, Newark
Parker, T. Sumner...Oxton, Southwell
Parkin, John...Goldthorpe, Worksop
†Parkinson, L. Milward...Epperstone, Nottingham
†Parr, John...Cropwell Butler, Bingham
Parr, Samuel...The Park, Nottingham
Paulson, F. W....Broomhill Grange, Ollerton
Pinder, T. J....Gamston, East Retford
Potter, Samuel...Ilkeston Park, Nottingham
Pyatt, Abraham...Wilford, Nottingham
Quibell, W. Oliver...Newark-on-Trent
Reek, Edward...Nuttall, Nottingham
Robey, Robert...Upper College Street, Nottingham
†Sanday, William...Radcliffe-on-Trent
Shepperson, Thomas...Lenton
Sherbrooke, Henry P....Oxton, Southwell
Simpson, John T....Boughton, Ollerton
†Smith, Edwards...Radcliffe-on-Trent
†Smith, Henry...Cropwell Butler, Bingham
†Smith, Henry, jun....Cropwell Butler, Bingham
Smith, Henry A....Wilford, Nottingham
Stafford, Thomas...Marnham, Newark
Stenton, Henry C....Southwell
Stephenson, William...Scaftworth, Bawtry
Storer, Chas., M.D....Lowdham Grange, Nottingham
Story, Henry V....Ruddington Manor
Taylor, J. Bagshaw...Radcliffe-on-Trent
Tinley, Edward...Southwell
Toder, E....South Muskham, Newark
Truswell, John R....Farnsfield, Southwell
†Vere, John...Carlton, Newark
Vernon, Granville H....Grove Hall, East Retford
Walker, John Deverell...Nottingham
†Ward, W. Squire...Wellow Hall, Ollerton
Watson, Robert...Scarrington, Whatton
Webb, W. F....Newstead Abbey, Mansfield
Welch, Bryan S....Gringley, Bawtry
White, Samuel...South Leverton, Retford
†Wigram, John...South Collingham, Newark
†Williams, Ashley G....Sparken, Worksop
Wood, J. P....Clumber Street, Nottingham
Woolley, T. Smith...South Collingham, Newark

†Wright, H. Banks...Sheldon Hall, Newark
Wright, William...Fiskerton, Newark
†Wright, William...Wollaton, Nottingham
Young, Edward...Coddington, Newark

OXFORDSHIRE.

Governors.

Camoys, Lord...Stonor Park, Henley-on-Thames
Marlborough, Duke of, K.G....Blenheim Park

Members.

Allnutt, T. Alexander..Watlington Farm, Tetsworth
Ashhurst, John H....Waterstock, Oxford
Bacchus, William E....Horley, Banbury
Baker, Rev. R. L....Ramsden, Enstone
Baker, William...Coombe Farm, Woodstock
Barford, John Phillips...Banbury
Barnett, Henry...Glympton Park, Woodstock
†Bateman, Henry...Asthall, Witney
†Bayley, Rev. W. R...Thornbury Park Down, Oxford
Beaumont, Joseph...Ducklington Hall, Witney
Blake, Alfred...Sutton, Stanton Harcourt, Witney
†Bowyer, Captain H. A....Steeple Aston, Woodstock
Brassey, Albert...Heythrop Park, Chipping Norton
Brickwell, C. J....Overthorpe Lodge, Banbury
†Brown, A. H. C....Kingston House, Tetsworth
Browne, Rev. T. C....42, St. Giles's, Oxford
Browning, James T....Oxford
Bryan, John...Southleigh, Witney
†Bulford, James...Hordley Farm, Woodstock
†Caless, William...Bodicote House, Banbury
Cannon, Joseph C....Beckley, Oxford
†Cartwright, Colonel H....Egdon Hall, Banbury
Cartwright, Richard Aubrey...Edgcott, Banbury
Castle, George...Sutton, Stanton Harcourt, Eynsham
Castle, George R....Bicester
Chamberlin, William...Adderbury, Banbury
†Chillingworth, John...Horsepath, Oxford
†Churchill, Lord...Cornbury Park, Enstone
Clarke, E. C....Haddenham, Thame
†Clarke, G. R....Chesterton Lodge, Bicester
†Clinch, Charles...Witney
†Cole, William Douglas...Bicester
Cooper, Henry Reeve...Britwell, Watlington
Craddock, R....Lyneham, Chipping Norton
†Dashwood, Major F. Loftus...Kirtlington, Oxford
Dashwood, Sir Henry W., Bart....Kirtlington Park
†Davenport, F. H....Headington Hill, Oxford
†Davis, R. S. B....Swerford Park, Enstone
†Dickers, Samuel S....Golder Manor, Tetsworth
Dodwell, J....Manor House, Long Crendon, Thame
Dormer, C. Cottrill...Rousham, Oxford
†Druce, A. F. Milton...Twelve Acres, Eynsham
†Druce, Joseph...Eynsham
†Eddison, W....Rosemount, Iffley, Oxford
Effingham, Earl of...Tusmore House, Bicester
†Franklin, Joseph...Scotsgrove House, Thame
Freeman, Edwin...Chilton, Thame
Garne, George...Churchill Heath, Chipping Norton
†Gaskell, Henry L....Kiddington Hall, Woodstock
†Gayner, C., M.A....1, New College Lane, Oxford
Gerring, R....Blenheim Park, Woodstock
Gillett, Frederick...Upton Downs, Burford
Gillett, John...Oaklands, Charlbury
Gillett, John...Tangley, Chipping Norton
Glen, George...Stratton Audley Park, Bicester
Godson, Nicholls S....Little Tew, Enstone
Godwin, Mrs....Troy Farm, Deddington
Greaves, John...Elsfield, Oxford
Griffin, J. Whitehouse...Towersey Manor, Thame
Gulliver, William...Swalcliffe, Banbury
Gutteridge, Charles...Assendon, Henley-on-Thames
Hall, Richard...Great Barford, Deddington
†Harcourt, E. W....Nuneham Park, Oxford
Hatton, William...Kingston, Tetsworth
†Hawkes, William...Thenford, Banbury
Hawkins, Robert S ...Broad Street, Oxford
Henley, Joseph J....Shotover Lodge, Oxford
†Henley, Rt.Hon. J.W., M.P...Waterpury, Wheatley
†Hester, George P....Oxford
†Holbech, Rev. C. W....Farnborough, Banbury
Hopkins, Rev. T. H. T....Magdalen College, Oxford
Howland, A. R....Ludesden House, Thame
Hughes, James...Wood Lawn, Oxford
Hutt, John...Water Eaton, Oxford
†Jacobs, Robert...Bury Barns, Burford
†Jersey, Earl of...Middleton Park, Bicester
†Keene, Rev. C. Ruck..Swincombe House, Nettlebed
King, W. Padbury...Lower Heyford, Banbury
Knollys, Gen. Sir W., K.C.B...Blount's Court, Henley
†Macclesfield, Earl of...Sherburn Castle, Tetsworth
†Mackenzie, E....Fawley Court, Henley-on-Thames
Mackenzie, W. D....Gillotts, Henley-on-Thames
Marriott, Captain E. J....Burford
Marsham, R., D.C.L....Merton College, Oxford
†Mason, James...Eynsham Hall, Witney
†Mather, D....Chadlington, Enstone
Matthews, Alfred T....Church Hanborough, Eynsham
Mewburn, W....Wykham Park, Banbury
†Middleton, Henry...Cutteslow, Oxford
Millington, Mrs....Ashgrove, Ardley, Bicester
†Morrell, F. J....St. Giles's, Oxford
Mumford, J. A....Chilton Park Farm, Thame
Nevell, Edward...Beaconsfield, Great Tew, Enstone
†Newton, R. J....Campsfield, Woodstock
†Newton, William. .Gould's Grove, Benson
†Norreys, Viscount...Wytham Park, Oxford
North, Lieut.-Colonel, M.P..Wroxton Abbey, Banbury
Parker, James S....Iffley, Oxford
Parrott, Edward...Shirburn, Tetsworth
†Parsons, Herbert ..Elsfield, Oxford
†Parsons, John...Iffley, Oxford
Parsons, W....Hill Farm, Elsfield, Oxford
†Paxton, Edmund...Willaston House, Bicester
Paxton, Jonas...Bicester
†Perry, T. A...Betham House, Avon Dasset, Banbury
Pickering, Leonard ..Wilcote, Charlbury
†Piercy, Alfred...Cold Harbour, Henley
Pinnell, Charles...Westwell, Burford
Porter, T. West...Holwell Manor Farm, Burford
Pritchard, W. T....Blounts Court Farm, Henley

Reade, J.…Shipton, Chipping Norton
Reynardson, H. B.…Adwell, Tetsworth
Robbins, Harry…Northfield Farm, Witney
Roberts, Joseph…Caswell House, Witney
Rowland, John…Holly Bank, Wootton, Woodstock
Rusher, William…High Street, Banbury
Samman, William…Middleton Park, Bicester
Samuelson, Bernhard, M.P.…Banbury
Savidge, Matthew…Sarsden, Chipping Norton
†Sheldon, Jonathan…Eynsham
Sheldon, Thomas…Osney Mill, Oxford
†Shillingford, George W.…Eynsham
Smith, Samuel…Somerton, Deddington
†Staples-Browne, F. J.…Brashfield House, Bicester
Stilgoe, Nathaniel…Adderbury, Banbury
†Stilgoe, Z. W.…Adderbury Grounds, Banbury
Tawney, A. R.…Banbury
Taylor, Thomas…Ashton Rowant, Tetsworth
†Thompson, Herbert E.…Wroxton, Banbury
Thomson, Guy…Old Bank, Oxford
†Thomson, John…Baldon House, Oxford
Tredwell, William…Elsfield, Oxford
Vanderstegen, W. H.…Cane End House, Henley
Ward, William…41, St. Giles's, Oxford
Watson, John…Shirburn Castle, Tetsworth
†Weaving, John W.…Oxford
Wiggins, Walter John…Watlington
Wiggins, Wm..Watcombe Manor Farm, Watlington
Wilkinson, William…Oxford
†Worley, William…Stanton Harcourt, Eynsham

RUTLAND.

Governor.

Gainsborough, Earl of…Exton Hall, Oakham

Members.

Addison, J.…Brookfield, Gretton, Uppingham
†Barnes, Wilson…Teigh, Oakham
Bosworth, J. G.…Greetham, Oakham
†Duncan, Alexander…Knossington Grange, Oakham
†Eyre, Edwin…Preston Hall, Uppingham
Finch, George H., M.P.…Burley-on-the-Hill, Oakham
†Gilford, William…North Luffenham, Uppingham
Painter, Benjamin…Burley-on-the-Hill, Oakham
Pinder, Robert…Whitwell, Oakham
†Tryon, Richard…The Lodge, Oakham
Ward, Robert…Harringworth, Uppingham
†Wing, William…Market Overton, Oakham
Winn, Mrs.…Uppingham
Wortley, Edward…Ridlington, Uppingham

SHROPSHIRE.

Governor.

Bradford, Earl of…Weston Park, Shifnal

Members.

Anderson, William…Nobold, Shrewsbury
Archer, James…Combermere Abbey, Whitchurch
†Ashdown, A. H.…Uppington, Wellington
Ashdown, S. Harding…Uppington, Wellington
Asterley, W. L.…Pentref, Llanymynech, Oswestry
Austin, Harry C.…Allscott, Wellington
Bach, Francis…Oinbury, Craven Arms
Bach, Philip…Elsich, Bromfield
Backhouse, R. O.…Westwood, Bridgnorth
Barber, Richard…Harlescott, Shrewsbury
Bate, John William…Astol, Shifnal
Bate, Richard Stokes…Badger, Shifnal
Bateman, J.…Croxton House, Whitchurch
†Bather, Thomas…Maesbury Hall Mill, Oswestry
Bayley, John…Tilstock, Whitchurch
Beck, Peter…Shrewsbury
†Beckwith, Rev. H.…Eaton Constantine, Wellington
Beeston, Thomas..Goldstone Manor, Market Drayton
†Benson, George…Lutwyche Hall, Wenlock
Bibby, J. J.…Hardwicke Grange, Shrewsbury
Bickerton, S.…Shotatton, Ruyton Eleven Towns
Bigge, C. Selby..Bourton Grange, Much Wenlock
Blantern, George G.…Haston, Hadnall, Shrewsbury
Booker, Joseph…Wilbrighton Hall, Newport
†Borough, C. B.…Chetwynd Park, Newport
Botfield, Rev. W. B. Garnett…Decker Hill, Shifnal
Boulton, John…Bowling Green Farm, Shifnal
Boulton, W. Baker…Forton Hall, Newport
†Bourn, James…Cleobury Mortimer
Bowen, Edward H.…Kingslow, Bridgnorth
Bowen, Humphrey C.…Chesterton, Bridgnorth
Bowen, John, jun.…Dunvall House, Bridgnorth
Bowen, Thomas…Wootton, Bridgnorth
Breeze, Edward..Old Marton, Whittington, Oswestry
Brewster, W.…Balderton Hall, Middle, Shrewsbury
Bright, John…Styche, Market Drayton
†Bromley, Richard, Uffington, Shrewsbury
Brooke, Rev. John…Haughton, Shifnal
Broughall, Edward…Wikey House, Ruyton Eleven Towns
Broughall, W..Little Fern Hill, Gobowen, Oswestry
†Broughton, P.…Tunstall Hall, Market Drayton
Brown, Henry…Preston, Wellington
Brown, Richard…Ruyton Eleven Towns
Browne, Samuel…Brocton Hall, Shifnal
Bulkeley, C. Rivers…Park Hall, Oswestry
Buchanan, Phillips…Hales Hall, Market Drayton
Burd, Henry…The Laurels, Shrewsbury
Burd, Thomas A.…Burcot, Wellington
Carr, Henry…Larden Grange, Wenlock
†Charlton, St. John C.…Apley Castle, Wellington
Clay, Charles…Whitchurch
Clay, Edward…Ellesmere
Clay, John…Kinsale, Whittington, Oswestry
Clews, R. T.…The Woodlands, Weston, Shifnal
†Cocks, Rev. C. R. Somers…Nene Savage Rectory, Cleobury Mortimer
Cocks, John…Dinchope, Wistanstow
Cooper, Thomas, jun.…Wrockwardine, Wellington
Cope, Edmund…Leighton Hall, Wellington
†Corbet, H. R.…Adderley Hall, Market Drayton
Corbett, Henry…Higford, Shifnal
Corbett, Thomas…Shrewsbury
Corden, Arthur H.…Brincton, Shifnal
Corden, John…Great Chatwell, Newport

Cottle, George...West Felton, Shrewsbury
†Cotton, Hon. R. W. S...Bourlton Park, Shrewsbury
Crane, Edward...Shrawardine, Shrewsbury
Crane, Joseph...Calcott, Shrewsbury
Cresswell, John...Pool House, Romsley, Bridgnorth
Cresswell, Stephens, jun....Romsley, Bridgnorth
Crowley, John L....Standford Hall, Newport
Cureton, George...Beam House, Shrewsbury
Danford, William Lewis...Langley, Bromfield
†Darby, Alfred...Little Ness, Shrewsbury
Davies, James...Felton Butler, Shrewsbury
Davies, James..Plasnewydd, Llanrhaiadr, Oswestry
Davies, Thomas W....Sugdon, Wellington
Davies, William...Mardre, Llandrinio, Oswestry
Davis, Evan H....Patton, Much Wenlock
†De Wend, W. Fenton...Oldbury, Bridgnorth
Dickin, E. T....Yockings Gate, Whitchurch
†Dickin, Thomas...Loppington, Wem
Dickin, William...The Lloyd, Market Drayton
Dunn, John...Fernhill Villa, Market Drayton
Eardley, John...Norton Farm, Market Drayton
Eaton, Charles O....Tolethorpe (Stamford)
†Eddowes, Thomas Henry...Pontesbury
Edwards, Edward...Boreton, Shrewsbury
Edwards, Edwin...Brocton Grange, Shifnal
Edwards, G. Withers, jun....Mardee Llandrinio, Oswestry
Edwards, R....Church House, Troy, Shifnal
Edwards, Richard...Adlington, Shrewsbury
Elwell, Charles...Evelith Manor, Shifnal
Emberton, Charles...Ferney Hough, Ellesmere
Emery, Richard A....Lostford, Market Drayton
Evans, John...Hadnall Wood, Hadnall
Evans, John...Uffington, Shrewsbury
Eyke, John...Stanton, Shifnal
†Eyton, Thomas C....Vineyard, Wellington
Farmer, John E....Felton, Ludlow
†Fenn, Thomas...Stonebrook House, Ludlow
Forester, G. T....Ercall Magna, Wellington
†Foster, W. O....Apley Park, Bridgnorth
Fowler, William...Acton Reynold, Shrewsbury
Fox, John...Coalbrookdale, Wellington
†France, James...Grinshill, Shrewsbury
Frank, John Charles...Rhydairy, Oswestry
Gartside, Wm...Smethcott, Wroxeter, Shrewsbury
†Gatacre, E. Lloyd...Gatacre Hall, Bridgnorth
†Godsall, Philip W....Iscoyd Park, Whitchurch
Goodall, Brittain..Helshaw Grange, Market Drayton
Goodall, W. H....Sutton, Market Drayton
Gouldbourne, J....Wilksley, Burleydam, Whitchurch
Gower, Andrew...Market Drayton
Grant, Owen E....Shavington, Market Drayton
†Granville, Earl, K.G....Aldenham, Bridgnorth
†Green, Joseph B....Marlow, Leintwardine
Griffithes, Thomas J....Bishops Castle
Griffiths, John...Houlston, Middle
†Groom, James...Arlston House, Wellington
Groves, Robert, V.C....Berrington, Shrewsbury
Hanmer, Lord...Bettisfield, Whitchurch
Harding, E. W....Old Springs, Market Drayton
Harding, John...Alveley, Bridgnorth
Harris, Thomas...Moston, Stanton
Hassall, William...Bubney, Whitchurch
Haste, Edwin...Weston, Shrewsbury
†Hawkins, Edmund...Dinthill, Shrewsbury
Heatley, John..Broughton, Harmer Hill, Shrewsbury
Heatley, John...Eaton, Market Drayton
†Heatley, R. T....Eaton Grange, Market Drayton
†Herbert, Major Gen. the Right Hon. Sir P. E., Bart., M.P....Styche, Market Drayton
Higgs, Albert A....Little Wenlock, Wellington
Hill, Rev. John...Hawkstone, Shrewsbury
Hill, Richard...Orleton Court, Ludlow
Hinckesman, C H....Charlcott, Bridgnorth
Hollis, Edward...West Felton
Hoole, Arthur...Hinnington House, Shifnal
Hornby, Captain R.M. ...Hanley House, Shrewsbury
†Hornby, Rev. R....Bayston Hill, Shrewsbury
Horton, George...Harley, Much Wenlock
†Horton, S. Lewis...Park House, Shifnal
Horton, Thomas...Harnage Grange, Shrewsbury
Hudson, C. D...Cheswardine, Market Drayton
Hudson, John...Sibberscott, Lea Cross
†Hudson, Samuel...Wytheford Hall, Shawbury
Hudson, Thomas...Longslow, Market Drayton
Humphreys, Edward...Walcot, Chirbury
Humphreys, W. T....Calcott Hall, Oswestry
Hunt, Rowland...Boreatton Park, Shrewsbury
†Hunter, L. R....Bedstow House, Aston-on-Clun
†Hunter, Patrick...Roden, Wellington
Ikin, Edward...Moat House, Wem
†Ingram, George...Chetwynd Park, Newport
Jenkin, H. B....Cotton Farm, Whitchurch
Jones, F....The Old Hall, Hanmer, Whitchurch
Jones, John...Higher Grange, Ellesmere
†Jones, J. Bowen...Ensdon House, Shrewsbury
Jones, James...Norville, Bridgnorth
Jones, Stephen...Lea Cross
Jones, Thomas...English Frankton, Ellesmere
Jones, Rev. William...Baschurch, Shrewsbury
†Jones, William...Harrington, Shifnal
Juckes, George...Beslow Hall, Wroxeter
Juckes, Mrs....Cotwall, Wellington
Juckes, Thomas...Tern, Wellington
†Justice, Henry...Hinstock, Market Drayton
Keary, H. W....Aldenham, Bridgnorth
Kelsall, Thomas...Bettisfield Hall, Whitchurch
†Kenyon, Hon. E....Maccfen, Whitchurch
†Knight, A. J. R. Boughton...Downton Castle, Leintwardine
Kynaston, Rev. W. C. E....Hardwick, Ellesmere
Langford, William...Cherbury Hall
Lea, James...Dodecote Grange, Market Drayton
Lee, Henry, Ensdon, Shrewsbury
Lee, J. H....Redbrook, Whitchurch
Lee, Thomas S....Brincton House, Shifnal
Leeke, Ralph L....Longford Hall, Newport
Leigh, William...Wilksley, Whitchurch
†Leighton, Stanley...Sweeny Hall, Oswestry
Lester, Thomas...Ollerton, Market Drayton
Lewis, George...Mickley Farm, Prees
Lewis, William...Shrewsbury
Lightfoot, F. L....Market Drayton
†Lloyd, Arthur P....Shawbury, Shrewsbury
Lloyd, G. Butler...Preston Montford, Shrewsbury
Lloyd, John...The Queen's Hotel, Oswestry

Lloyd, J. A....Leaton Knolls, Shrewsbury
†Lloyd, Richard T....Aston Hall, Oswestry
Lowe, Isaac...Donnington, Newport
†Lowndes, W. L...Linley Hall, Broseley
Mainwaring, R. K....The Hills, Market Drayton
†Mainwaring, Salusbury K....Oteley, Shrewsbury
Mansell, Andrew...Little Ness, Baschurch
†Mansell, Thomas...Ercall Park, Wellington
†Mansell, Thomas J....Adcott Hall, Baschurch
Matthews, Henry...Montford, Shrewsbury
Meire, T. L...Eyton-on-Severn, Shrewsbury
Meredith, Richard...Rednal, Shrewsbury
Minor, John...The Grove, Kingsland, Shrewsbury
†Minton, John...Forton, Shrewsbury
Moody, General...Caynham House, Ludlow
†More, R. Jasper...Linley Hall, Bishop's Castle
Morris, E. H....West Farm, Chirbury
Mort, William...Marton, Baschurch
Nevett, William...Yorton, Harmer Hill, Shrewsbury
Newill, Joseph...Lydbury North
†Newport, Viscount, M.P....Weston, Shifnal
Nickolls, James...Tuck Hill, Bridgnorth
†Nightingale, Vaughan E....Burway, Ludlow
Nock, Charles...Norton, Shifnal
Nock, Thomas...Sutton Maddock, Shifnal
Norris, W. G....Coalbrookdale, Wellington
Nunnerley, J. A....French Farm, Ellesmere
Nunnerley, Richard...Wems Northwood, Wem
Nunnerley, Thomas...Bradley Green, Whitchurch
Nunnerley, William...Belton Farm, Whitchurch
†Palin, William...Twyford House, West Felton
Palmer, Robert...Nagington, Market Drayton
†Parry, Charles...Houghton, Ellesmere
†Payne, William...Willcott, Nesscliff
†Peck, Edmund...Plas-y-Ddinas, Shrewsbury
†Pemberton, Rev. R. N...Millichope Park, Church Stretton
†Perry, Graddon...Acton Pigott, Condover
Perry, W. H....Sytch, Claverley, Bridgnorth
Phillips, G. T....Brockton Leasowes, Newport
Picken, William...Hilton, Newport
Pigot, Arthur...Felhampton Court, Church Stretton
Platt, John...Belle Vue, Wem
Plowden, W. F....Plowden Hall, Lydbury North
†Poole, C. H....Marbury Hall, Whitchurch
Preece, W. G....Shrewsbury
Price, Andrew...Bagley, Ellesmere
Price, T. S....Felton Butler, Baschurch
†Pritchard, John...Broseley
Pryse, Colonel...Peithyll, Bowskeet, Shrewsbury
†Pryse, Sir Pryse, Bart....Gogerddan, Bowskeet
Pugh, George...Wheathill, Wellington
†Pugh, William...Coalport, Ironbridge
Purton, C. C....The Woodhouse, Cleobury Mortimer
Radcliffe, Thomas...Cheswell Grange, Newport
Rainforth, Edward...Monkhopton, Bridgnorth
†Ralph, R. W....Honnington Grange, Newport
Ravenshaw, Henry...Ash Hall, Whitchurch
Ravenshaw, James..Bridleway Gate, Preston Brockhurst
Richards, Edward...Maesbury, Oswestry
†Richards, John...Llyncleys, Oswestry
Richards, Richard...Glascold, Llansilin, Oswestry
Rider, Thomas...Edgeboulton, Shawbury
Rider, Thomas John...Kenwick, Shrewsbury
Rider, William...Crudgington, Wellington
Roberts, Benjamin...Belle Vue, Oswestry
Roberts, T. Lloyd...Corfton Hall, Bromfield
†Robinson, George...Whiston, Shifnal
†Rouse-Boughton, Sir C. H., Bart....Downton Hall, Ludlow
Saunders, G. J....Oswestry
Sheraton, John Robinson...Ellesmere
Sheraton, William...Broom House, Ellesmere
Shingler, J. H....Birch Hall, Ellesmere
Shuker, John...Keightley Hall, Chirbury
Simon, Thomas...Fern Hill, Market Drayton
Sing, William...Newton, Bridgnorth
Slaney, John...Purville House, Wellington
Smith, Garland...Eaton Constantine, Wellington
Smith, Mrs. H....New House, Sutton Maddock, Shifnal
Smith, Henry...Eaton Constantine, Wellington
Smith, Henry ..Harnage, Shrewsbury
Smith, R. Thursfield...Whitchurch
Smith, Thomas...Stableford, Bridgnorth
Smith, William...Little Hales, Newport
Smyth, Sir C. F., Bart....Acton Burnell, Shrewsbury
†Smythies, George...Leintwardine, Shrewsbury
Spence, Henry...Heath Lodge, Shrewsbury
Sprott, James...College Hill, Shrewsbury
Stanier, John E....Uppington, Wellington
Stanley, Henry...Upton, Shifnal
Stedman, W....Bucknell House, Bucknell
Steedman, E. B....High Ercall Hall, Wellington
Steele, John...Bridgwater Arms Hotel, Ellesmere
†Steward, T. L....Crudgington, Wellington
Summer, Richard...Worfield, Bridgnorth
Summers, Thomas, jun....Cowgreaves, Shifnal
Tanner, Richard...Frodesley, Donington
Taylor, Edward...Whitton, Leintwardine
Taylor, Richard...Sidney House, Wellington
Taylor, William H....High Hatton, Shawbury
Teece, Richard...Weston Villa, Baschurch
Tench, John...Ludlow
Thomas, Edward...Victoria Parade, Oswestry
Thomas, Richard...The Buildings, Baschurch
Thomas, Robert...Eaton Constantine, Ironbridge
Thomas, Thomas...Treprenal, Oswestry
Thompson, T. Warren..Claremont Bank, Shrewsbury
Thursfield, Thomas H....Barrow, Broseley
Titterton, J. Ward...Shifnal
Topham, Thomas...The Twemlows, Whitchurch
Tudge, William...Adforton, Leintwardine
Tyrwhitt, Sir H., Bart....Stanley Hall, Bridgnorth
Underhill, W. S....Newport
Vaughan, L. E...Trederwen Hall, Arlein, Oswestry
Vaughan, W....The Lodge, Ruyton Eleven Towns
Vernon, Benjamin...Aychley, Prees
†Vickers, Valentine...Ellerton Grange, Newport
Wade, Arthur F. S....Condover, Shrewsbury
Wain, George..The Rowney Farm, Market Drayton
Wakeman, Sir Offley, Bart.....Borrington Lodge, Chirbury
†Wakeman-Newport, H. A.....Coton Hall, Bridgnorth

Ward, William...Knockin Heath, Oswestry
Warter, H. de Grey.. Longden Manor, Shrewsbury
Webster, F T....Bishton Hall, Shifnal
Wedgwood, A E....Breadenheath, Ellesmere
Weston, Philip...Coalbrookdale, Wellington
Whitfield, Edward...Oswestry
Whitfield, Thomas...Ashford Grange, Prees
Whitfield, T. N....Lostford, Market Drayton
†Whitmore, Rev. F. H. Wolryche..Dudmaston Hall, Bridgnorth
Whittingham, L B....Llandrinio Hall, Oswestry
Wilde, H. J....Hopstone, Claverley, Bridgnorth
Wilkes, Samuel...Brewers Oak, Shifnal
Williams, Hugh...Chesterton, Bridgnorth
Williams, Matthew...Dryton, Wroxeter
Williams, Thomas...Albrightlee, Shrewsbury
Wilson, Rev. Hugh Owen...Church Stretton
Wilson, John...Aston Hall, Claverley, Bridgnorth
Wingfield, C....Onslow Hall, Shrewsbury
Wood, Edward...Culmington Manor, Bromfield
Woodfin, John...Aston, Wem
Woolrich, Joseph...Old Marton, Oswestry
Wright, Edmund...Halston, Oswestry
Wyley, Henry James...Bridgnorth
†Wyley, William...Roughton, Bridgnorth
†Wyley, W. John...Admaston, Wellington
Yates, Frank G....Ironbridge
Yates, James...Aitchley, Shifnal
Yates, William...Grindle House, Shifnal

SOMERSETSHIRE.

Governors.

Bridport, Major-Gen. Viscount...Cricket St Thomas, Chard
Dickinson, Francis Henry..King's Weston, Somerton
†Miles, Sir William, Bart....Leigh Court, Bristol
†Popham, F. L...Hunstrete House, Chelwood, Bristol

Members.

Abraham, Thomas...Dunster, Taunton
Allen, Major Ralph S., M P ..Shockerwick, Bathford
Alleyne, E W. F. H ...Hillmore, Taunton
†Aplin, Henry...Coombe St. Nicholas, Chard
Ashford, E. C, M D ...Moorland, Bridgwater
Badcock, Henry Jefferies...Taunton
†Bailey, James...Burnham, Bridgwater
†Barker, G. L Raymond...17, Royal Crescent, Bath
†Barton, Charles...Holbrook House, Wincanton
†Batten, John...Yeovil
Bell, J. Williams...Gillingham, Bath
Bennett, Thomas Oatley...Bruton
Bird, William...Volis, Kingston, Taunton
Blake, Rice...Taunton
Blake, Thomas...Cutsey, Wellington
Blake, William...Bridge, Ilminster
Bond, James H....Heathfield, Taunton
Boon, James...Up Lyme, Axminster
Bradbeer, John...Pyrland Hall Farm, Taunton
†Braikenridge, J. H... Chew Magna, Bristol
†Bruford, Nicholas...Tolland, Wiveliscombe
†Bullen, John T....Marshwood Manor, Crewkerne
Bullen, William...Wayford Farm, Crewkerne
†Bullock, George...East Coker
†Bult, James S ...Dodhill House, Kingston, Taunton
†Capel, Arthur...Bulland Lodge, Wiveliscombe
Chaffey, Ebenezer...Keinton Mandeville, Somerton
†Clarke, T. E ...Long Run, Taunton
Clerk, Arthur...6, Green Park, Bath
†Clerk, E. H... Burford, Shepton Mallet
Colthurst, John...Chew Court, Chew Magna, Bristol
Cope, E G ...Pembroke Road, Clifton, Bristol
†Cuff, W. Fitchett...Merriott, Taunton
Culverwell, James C ...Clavelshay, Bridgwater
Culverwell, William T ...Durley Farm, Bridgwater
Davis, John G ...Blagroves, Milverton, Taunton
†Dean, A. Keball....East Brent, Axbridge
†Dean, F. Keball...East Brent, Axbridge
†Dickinson, E H....Berkeley, Frome
Dove, Jacob...Hambrook House, Bristol
†Duckworth, Russell...Murtrey Hill, Frome
Dyke, Thomas...Ashton Lodge, Bristol
Easton, Richard...Stone House, Taunton
Easton, William...6, Hammet Street, Taunton
Edwards, Charles...The Grove, Wrington
Edwards, Joseph...Hutton, Weston-super-Mare
England, John...Chard
†Farthing, Walter...Stowey Court, Bridgwater
†Fitzgerald, Maj. H. T. G..Mapperton Ho, Wincanton
Fussell, Rev. James G C....The Chantry, Frome
Gibbons, George...Tunley Farm, Bath
†Gibbs, George...Belmont, Bristol
Gibbs, William...Tyntesfield, Bourton, Bristol
Gibbs, W. S ...Manor House, Cothelstone, Taunton
Goodwin, Josiah...Bath
†Gray, G. W....Castle Carey
†Gray, Jonathan... Backwell Hill, Bristol
†Grenville, R. Neville, M P..Butleigh Ct, Glastonbury
†Grove, Miss.. Zeals House, Bath
†Halliday, J....Chapel Cleeve, Taunton
Hancock, J. D. ..Halse, Taunton
Harbin, George...Newton House, Yeovil
Harding, I. King...Maiden Bradley, Bath
†Harford, J B ..Blaise Castle, Henbury, Bristol
†Harford, W ..Barley Wood, Wrington, Bristol
Hellier, W G.. .Wick St Lawrence, Weston-super-Mare
Helyar, W H. .Coker Hall, Yeovil
†Henley, H C....Leigh House, Chard
Hewett, W. H ...Norton Court, Taunton
Hicks, G H T....Hill Grove, Wells
Hill, George J ...Percy Villas, Fishponds, Bristol
†Hippisley, John. .Stone Easton, Bath
Hole, James...Knowle, Dunster
†Hood, Sir A. A, Bart....St. Audries, Taunton
†Hood Hon Captain A....Cricket St Thomas, Chard
†Horner, John F ...Mells Park, Frome
Hosegood, Obed...Dillington, Ilminster
†Hoskins, Thomas...Haselbury, Crewkerne
†Keir, John R. ..Chewton Farm, Stone Easton, Bath
Kemble, Henry...Vellore, Bath
†Kensington, E. T....Weston-super-Mare
Kidner, Samuel...Milverton
Kidner, William...Kingston, Taunton

King, R. King Meade...Walford, Taunton
†Knatchbull, William...Babington, Frome
Knollys, J. E....Fitzhead Court, Taunton
Lang, T. M....Barrington Court, Ilminster
Langton, S. Gore...Newton Park, Bristol
†Langton, W. H. P. Gore...Newton Park, Bath
†Lee, Vaughan H....Dillington Park, Ilminster
Lethbridge, A. G....Eastbrook House, Taunton
†Lethbridge, Charles...Canonsgrove, Taunton
Lethbridge, Sir W. A., Bart...Sandhill Park, Taunton
†Lovell, Edwin...Dinder, Wells
†Lovell, E. W. Lovell...Dinder, Wells
Luttrell, Rev. A. H. F..Minehead Vicarage, Taunton
†Luttrell, G. F....Dunster Castle, Dunster
Luttrell, Colonel H. A. F....Badgworth Court, Weston-super-Mare
Male, Henry...East Chinnock, Yeovil
Maud, Charles T....Waterhouse, Bath
†Miles, J. W....King's Weston, Bristol
†Miles, P. W. S....61, Queen Square, Bristol
Moor, H. P....Queen Charlton Manor, Bristol
†Moysey, Henry G...Batheaton Court, Wiveliscombe
†Naish, W. B....Stone Easton, Bath
†Napier, E. B....Pennard House, Shepton Mallet
Ostler, John...Isle Brewers, Taunton
Paget, Edward...Burnett, Bristol
†Paget, Major R. H., M.P...Cranmore Hall, Shepton Mallet
Parham, Edmund...Bristol
†Parsons, George...Martock
†Parsons, Henry...Haselbury, Crewkerne
†Paull, J. W....Knott Oak House, Ilminster
Penny, Thomas...Taunton
Peren, W. B....Compton, South Petherton
Pinney, Col. W...Somerton Erleigh, Taunton
Proctor, T....Elmdale House, Clifton, Bristol
Rayer, W. Carew...Holcombe Court, Wellington
Robinson, John...Backwell House, Bristol
Robinson, W....Wembdon, Bridgwater
Skinner, Alfred C....Bishop's Lydeard, Taunton
Skrine, H. D....Warley Manor, Bath
†Smith, William...Sandon House, Clifton, Bristol
†Somerville, J. C...Dinder House, Wells
Spackman, H....Bloomfield House, Bath
†Sparks, William...Crewkerne
†Spurr, Anthony...West Coker, Yeovil
†Stephens, Robert...13, Paragon, Bath
Strangway, H. B....Shapwick, Bath
Stuckey, H....Cannington, Bridgwater
†Surtees, W. E....Tainfield House, Taunton
Trevilian, Edwin C....Curry Rivel, Taunton
Warre, Henry...Langford Budville, Wellington
Warry, George...Shapwick, Glastonbury
Were, Francis...Gratwicke Hall, Barrow Gurney
Wightman, John...Chard
Wollen, Joseph...Wedmore
Woodforde, F. H., M.D...Amberd House, Taunton

STAFFORDSHIRE.

Governors.

†Buller, Sir E. M., Bt., M.P..Dilhorne Castle, Cheadle
†Calthorpe, Lord...Perry Hall, Stafford
†Dartmouth, Earl of..Patshall Hall, Wolverhampton
Shrewsbury and Talbot, Earl of...Ingestre Hall, Stafford
†Sutherland, Duke of, K.G....Trentham Hall

Members.

Abbotts, R. W....Burton-on-Trent
Adamson, John...Tillington House, Stafford
†Addison, S. T....Edenhall, Eccleshall
Allen, George...Knightley Hall, Eccleshall
†Allsopp, S. C., M.P....Marchington, Uttoxeter
Alsop, William, jun....Cotes Lodge, Stone
Arnold, William...Lichfield Street, Tamworth
Ashcroft, Thomas...Walford, Eccleshall
Averill, Charles, jun....Pyrehill, Stone
Averill, E....Wood Gate, King's Bromley, Lichfield
Averill, George Hanson...Wood End, Lichfield
†Avery, William Howard...Tixall Heath, Stafford
Bagnall, George...Draycot, Cheadle
†Bagot, Lord...Blithefield, Rugeley
Bamford, Henry...Uttoxeter
Bantock, T....Merridale House, Wolverhampton
Barnes, John...Shenstone, Lichfield
Barnett, T. J....Tettenhall Road, Wolverhampton
Barratt, C. Underwood...Eccleshall
†Barrow, Wm....Bilbrooke House, Wolverhampton
Barton, J. Pipe...Bangley, Tamworth
Bass, Michael T., M.P....Burton-on-Trent
Bate, Samuel...Springfields, Newcastle-under-Lyme
Beach, Mrs....The Hattons, Brewood
Bealey, J. Edward...Bloxwich, Walsall
†Bennion, Owen...Cresswell, Stafford
Bill, John...Trent Vale, Stoke-on-Trent
Birch, James...Pearse Hay, Penkridge
Bloxcidge, John Smith...Mere Pits, Tamworth
Blurton, Edward...Wolverhampton
Blurton, W. Mountfort...Field Hall, Uttoxeter
Bond, Benjamin...Draycot, Stoke-on-Trent
Boot, William...Chesterfield, Lichfield
Booth, Daniel...Audley, Newcastle
Booth, John...Shenstone Hall, Lichfield
Booth, Thomas...Tamborne Park, Lichfield
Boothby, C. E....Needwood Forest, Burton-on-Trent
Bostock, Edwin...The Haugh, Stafford
Bostock, Thomas ..Waterloo House, Burslem
Bourne, John...Hildenstone, Stone
Bradburn, William...Hilton, Wolverhampton
Bradburne, J. Hanbury...Pipe Place, Lichfield
Brawn, James...Shenston, Lichfield
Brawn, John...Sandhills, Walsall
Brealey, John...Leek
Brewster, John...Stretton Mill, Penkridge
Bridgwood, George...Bedwall, Stafford
†Briggs, Thomas...Fisherwick, Lichfield
†Briggs, William...Elford Park, Tamworth
†Briscoe, Arthur...Vale Head, Wolverhampton
†Briscoe, R. H....Somerford Hall, Brewood
Broomhall, T. T., M.D....Beech Cliff, Newcastle
Brough, William S....Fowlchurch, Leek
Brown, Charles...Park Hall, Leigh, Cheadle
Brown, C. W. Swinfen...Swinfen Hall, Lichfield
Brown, Richard...Walton Bank, Stone
Brown, Robert...Wiggington House, Tamworth

†Buller, Morton Edward...Dilhorne, Cheadle
Burchnall, Samuel...Catton, Burton on-Trent
Butler, W....The Cedars, Compton, Wolverhampton
Byrd, Charles...Littywood, Stafford
Carrington, William T....Croxton Abbey, Uttoxeter
Cartwright, Fowler...Drakelow, Burton-on-Trent
Cartwright, H. J....Short Heath, Wolverhampton
Cartwright, Robert...Tettenhall, Wolverhampton
Cartwright, Sidney..The Leasowes, Wolverhampton
Challenor, John..Blackwood, Endon, Stoke-on-Trent
Chawner, Henry...Hound Hill, Uttoxeter
†Chawner, Richard Croft...The Abnalls, Lichfield
Cheatle, T. Farmer...Dosthill, Tamworth
†Clarke, Charles F... Purton Grove, Wolverhampton
Cleminson, Robert...Endon, Stoke-on-Trent
Clifford, Sir Charles, Bart...Hatherton Hall, Cannock
Clifft, Samuel...Fordhouse Mill, Wolverhampton
Collins, William...Aston Farm, Stone
Colvile, Captain A. H. A....Churnett Grange, Leek
Couth, William...The Shrubberies, Walsall
Coxon, John...Freeford Farm, Lichfield
Crisp, Charles E....Alrewas, Lichfield
†Darling, J....Beau Desert, Rugeley
Davis, Robert A., M.D....Burntwood, Lichfield
Denton, Henry ..Wolverhampton
Deykin, James....Whiston, Penkridge
Douglas, J. Bryant...Lullington, Burton-on-Trent
Dyott, Col., M.P....Freeford Manor, Lichfield
†Elwell, Charles John...Compton, Wolverhampton
Every, Sir H. F., Bart...Egginton Hall, Burton-on-Trent
†Farmer, C. Haywood...Comberford Hall, Tamworth
†Farwell, Frederick G....Wolverhampton
†Fellows, Titus...Great Wyrley Hall, Walsall
Fitzherbert, Sir W., Bt...Somersall Herbert, Uttoxeter
†Fitzherbert, William...Swynnerton, Stone
Foden, Edward ..Teddesley, Penkridge
†Forster, Charles, M.P....Lysways Hall, Rugeley
Forsythe, James...Wolverhampton
†Fowler-Butler, Captain R.....Barton-under-Needwood
Fuller, W. A....Codsall, Wolverhampton
Garde, R. D....Yew-Tree Farm, Penkridge
Gibbs, Thomas...Geary House, Bretby, Burton-on-Trent
Giffard, Walter T. C ...Chellington, Wolverhampton
Gilbert, John...Beech-Tree House, Wood, Walsall
Gillard, Henry...Stafford
Gilpin, Bernard...Longford, Cannock
Ginders, Samuel...The Hough, Stafford
†Glover, John...Bangley, Tamworth
Glover, Robert...Blackbrook, Lichfield
Gough, Ralph D....Willenhall
Grier, William M....Rugeley
Griffin, Thomas J....Preston Vale, Penkridge
Grindley, William...Weeping Cross, Stafford
Hadderton, Henry...Acton Mill, Eccleshall
†Hardy, John...Dunstall Hall, Burton-on-Trent
Hardy, Richard...Marchington, Uttoxeter
Harrison, Colonel J....Norton Hall, Cannock
Hartill, J....Willenhall, Wolverhampton
Hatherton, Lord...Teddesley, Penkridge
Heath, Robert, M.P....Biddulph Grange, Stoke-on-Trent
Heatley, J. H....Engleton Hall, Penkridge
Heatley, Thomas...Pattingham, Wolverhampton
Heaton, Thomas...Castle Hill, Alton, Cheadle
Hewson, John Dale, M.D....Coton Hill, Stafford
†Higgs, J. Birch...Brewood, Penkridge
Hill, A. Staveley, M.P.....Oxley Manor, Wolverhampton
Hill, John...Clifton Lodge, Stafford
†Hiron, Samuel...Elford Lowe, Tamworth
†Holland, Dr. C ...St. Chads, Lichfield
Holland, William...Streethay, Lichfield
Hollis, Henry W....Keele, Newcastle
Holloway, Joseph.. Tutbury, Burton-on-Trent
Horsfall, T. B....Bellamour Hall, Rugeley
Horsley, E. H....Colton, Rugeley
Horton, Enoch..New Oxley Farm, Wolverhampton
Hulme, Thomas...Endon, Stoke-on Trent
Inge, Charles H....Whittington Hurst, Lichfield
Inge, Rev. George...Thorpe Constantine, Tamworth
James, Frank...Aldridge, Walsall
James, John...Sandon Hall Farm, Stone
James, Thomas...Shushions Manor, Church Eaton
Jenkinson, F....Marston, Stafford
Jenks, Thomas...Orton, Trysull, Wolverhampton
Jenks, William...Upper Fenn, Wolverhampton
Jervis, Hon. E. Swinfen...Aston Park
Keeling, C. R....Congreve, Penkridge
Keeling, G. B....Hampton House, Penkridge
Kendrick, Edward...Weeford, Lichfield
Knight, Edward...Sandon, Stone
Knight, John L....Barton-under-Needwood
Knight, Josiah...Milwich, Stone
†Kynnersley, C. T. Sneyd...Highfields, Uttoxeter
Landor, W. J....Lee Hall, Rugeley
†Lane, Lieut.-Col...King's Bromley Hall, Lichfield
Lawrence, J. W....Chesterfield Grange, Lichfield
†Leaver, Francis...Longnor Hall, Penkridge
Lewisham, Viscount...Patshull, Wolverhampton
Lichfield, Earl of...Shugborough
†Locker, William T....Aston, Stone
Lovatt, Henry...Finchfield House, Wolverhampton
†Loveridge, Samuel...Chapel Ash, Wolverhampton
Lowe, Edward...Comberford Mill, Tamworth
Lowe, Richard...High Green, Wolverhampton
Lowe, Thomas...Trysull, Wolverhampton
Lyon, Charles Edward...Johnson Hall, Eccleshall
Madan, Martin...Haselour, Tamworth
Mainwaring, Rev C. H....Whitmore, Newcastle
Major, John C....The Bhylls, Wolverhampton
†Manley, A. E....Manley Hall, Lichfield
Marson, John...Acton Mill, Stafford
Martin, E. Hall, jun....Barr Hill, Madeley
†Masfen, R. H....Pendeford, Wolverhampton
Matthews, Charles..Cleveland Road, Wolverhampton
†May, G. A....Elford Park, Lichfield
Mayou, J. Webster...Fazeley, Tamworth
Meakin, H. J ...Shobnall Grange, Burton-on-Trent
Mellard, Ralph...Rugeley
Menzies, George...Trentham, Stoke-on-Trent
Miller, J. Norton...Pattingham, Wolverhampton
Minor, A. Henry...Kiddermore, Penkridge
Mitchell, John...The Beacon, Penkridge
†Monckton, Francis...Stretton Hall, Penkridge

Morris, Sir John. Whitewick House, Wolverhampton
Morton, J.....Moseley Court, Bushbury, Wolverhampton
†Morris, C. J....Wood Eaton Manor, Stafford
Mosley, Sir Tonman, Bart....Burton-on-Trent
Mott, William...Wall, Lichfield
†Mynors, W. C. T....Elford Lowe, Tamworth
†Negus, Thomas A....Lynn House, Walsall
Neville, Thomas...Shenstone House, Lichfield
†Newdigate, F. W..Byrkley Lodge, Burton-on-Trent
Okeover, H. C....Okeover (Ashbourne)
Owen, John...George Hotel, Lichfield
Page, Francis...Uttoxeter
Peel, Right Hon. Sir R., Bart., M.P....Drayton Manor, Fazeley
†Peile, Rev. T. W....Cannock Vicarage
Perry, Rev. E. C....Seighford, Stafford
Perry, F. C...Dunston, Penkridge
Perry, Thomas J....Wergs Hall, Wolverhampton
Perry, William...Hickmerelands, Sedgley, Dudley
†Philips, John C....Cheadle, Stoke-on-Trent
Philips, J. W....Heybridge, Cheadle
Phillips, T. H....Brooklands Farm, Perry Barr
Plant, Edward...Burley Fields, Stafford
Poyser, Josiah T....Burton-on-Trent
Pratt, C. Alfred...Bloxwick Mill, Walsall
Pullen, Richard...Standeford Mill, Wolverhampton
Pursell, R. R....Oxley, Wolverhampton
Ratcliffe, J. Morris...Silverdale, Newcastle
Richardson, F. E.. Bramshall, Uttoxeter
†Ridgway, John...Sheldon, Stoke-on-Trent
Robinson, Thomas...Tatenhill, Burton-on-Trent
Robotham, A....Drayton Basset, Tamworth
†Rogers, Henry...Wolgarstone, Penkridge
Rogers, W. H....Goldthorne Villa, Wolverhampton
Round, Samuel...The Hollies, Cheddleton, Leek
Salt, Thomas, M.P....Weeping Cross, Stafford
Sandon, Lord...Sandon Hall, Stone
Sankey, Thomas...Burntwood, Lichfield
Senior, James...The Pennicroft, Stafford
Shaw, George...Day Hills, Stone
†Shaw-Hellier, Capt....Wimborne, Wolverhampton
Shelton, J. M...Springsfield, Oaken, Wolverhampton
Shelton, W. G......The Grange, Wergs, Wolverhampton
Smith, Henry...Summerhill, King Swinford, Dudley
†Smith, T. Carrington...Admaston, Rugeley
Sneyd, Rev. Walter...Keele Hall, Newcastle
Sollom, Francis...Pennfields, Wolverhampton
Stamer, Rev. Sir L. T....Cliffville, Stoke-on-Trent
Stanley, C. Payne...St. Stephen's Hill, Rugeley
Stanley, Henry..Yield Field Hall, Bloxwich, Walsall
Startin, John...Brizlincote, Burton-on-Trent
Stokes, Frederick S....Hall End, Tamworth
Stokes, George...Hints, Lichfield
Strongitharme, G....Rushall, Walsall
Stubbs, Charles...Preston Hill, Penkridge
Stubbs, John...Burston House, Stone
Stubbs, Samuel...Bridgford, Stafford
Stubbs, Thomas...Hammerwich, Lichfield
Stubbs, William...Rickerscote, Stafford
Summerfield, J....Green Barn, Lichfield
Swift, George...Hanchurch, Newcastle
Taylor, George...Dudley
Taylor, Henry...Pattingham, Wolverhampton
Taylor, William...Stretton, Penkridge
Thompson, William...Walton, Stone
Tildersley, James...Willenhall, Wolverhampton
Timmis, Charles...Brick House, Stafford
Timmis, John...Rugeley
Tomkinson, William...Newcastle
Tompkin, S....Woodhouse, Whitmore, Newcastle
Troutbeck, George...Barton-under-Needwood
†Tudor, G. S....Park House, Lapley, Penkridge
†Turnor, E. Weston...Brereton, Rugeley
Twentyman, A. C....Castlecroft, Wolverhampton
†Vaughan, Edmund M....Lapley, Penkridge
Vernon, H. C....Hilton Park, Wolverhampton
Walker, Robert Hay...Chillington, Wolverhampton
Walker, Samuel...Tutbury, Burton-on-Trent
Wallworth, George...Bridgeford, Stone
†Ward, George...Bearnett House, Wolverhampton
†Ward, Henry...Rodbaston, Penkridge
†Wardle, Henry...Stanton House, Burton-on-Trent
†Waterpark, Lord...Doveridge Hall, Uttoxeter
†Webb, Charles J....Elford House, Tamworth
†Wight, C. B....Rudge Hall, Wolverhampton
Wilde, Edward...Sandyford, Stone
Wilkinson, C. T....Madeley, Newcastle
Williams, Walter...Sugnall Hall, Eccleshall
†Williamson, Hemhall...Greenway Bank, Burslem
Winterton, Thomas...Alrewas Hay, Lichfield
†Wolferstan, F. S. P....Statford Hall, Tamworth
Wolseley, Sir C. M., Bart....Wolseley, Stafford
Wood, John...High Street House, Uttoxeter
Woodcock, Richard..Darlington St., Wolverhampton
Woodroffe, David...Chase View, Rugeley
Woolf, Thomas...Standon Hall, Eccleshall
†Woolley, Thomas...Newton Regis, Tamworth
Wright, S....High Onn, Church Eaton, Stafford
†Wrottesley, Lord...Wrottesley, Wolverhampton
†Wyatt, Robert...Acton Hill, Stafford
Wynne, Thomas...Manor House, Gnosall

SUFFOLK.

Governors.

†Duleep Singh, His Highness the Maharajah..Elveden Hall (Thetford)
Grafton, Duke of...Euston (Thetford)
Kerrison, Sir E. C., Bart....Brome Hall (Scole)
†Stradbroke, Earl of....Henham Park, Wangford

Members.

†Allix, W. T....Campsea Ash, Wickham Market
†Anstruther, J. H. L....Hintlesham Hall, Ipswich
Arnold, Rev. Richard A....Ellough, Beccles
†Atkinson, W....Great Rapers, Bures St. Mary's
Barlow, Colonel F....Hasketon, Woodbridge
Barnardiston, N. C....The Ryes, Sudbury
Baskett, Nathaniel...Wetheringsett, Stonham
†Bates, George W...Northgate St., Bury St. Edmund's
Bedingfield, Lieut. James, R.N....Bedingfield, Eye

†Bence, Captain...Kentwell Hall, Long Melford
Bence, Henry A....Thorington Hall, Saxmundham
Benyon, Rev. E. R....Culford, Bury St. Edmund's
†Berners, John...Holbrook, Ipswich
Bevan, Beckford...Bury St. Edmund's
†Biddell, Herman...Playford, Ipswich
†Biddell, Manfred...Playford, Ipswich
†Biddell, William...Lavenham Hall, Sudbury
Blundell, Arthur...Chediston Hall, Halesworth
†Boby, Robert...Bury St. Edmund's
Boldero, John...Rattlesden, Woolpit
Branwhite, F....Chapel House, Long Melford
†Bromley, Joseph R....Playford Mount, Woodbridge
Brooke, H....Wetheringsett, Stonham
Brooke, John W....Sibton Park, Yoxford
†Browne, Colvile...Park House, Long Melford
†Bunbury, Sir C., Bart....Great Barton Hall, Bury St. Edmund's
†Burrell, R....Westley Hall, Bury St. Edmund's
Byford, William...The Court, Glemsford
†Cartwright, R. Norton...Flixton, Bungay
Catchpole, Nathaniel...Bramford, Ipswich
Chapman, William...Orwell Place, Ipswich
†Clayden, J. Carter...Ellough Hall, Beccles
†Clayton, E. E...Guildhall Street, Bury St. Edmund's
Cobbold, John Chevallier, M.P....Ipswich
Cocksedge, James S....Stowmarket
Cooke, Robert C....Livermere, Bury St. Edmund's
Cooper, James....Barton Mere Farm, Bury St. Edmund's
Cooper, J. R.....Barton, Bury St. Edmund's
Corrance, F. S....Broadwater, Framlingham
Cracknell, A....The Grove, Thornham, Eye
Crisp, Arthur W....Orford, Wickham Market
†De Grey, Hon. and Rev. F..Copdock Rectory, Ipswich
Delf, S. Newton....Longwood House, Bungay
†Easterson, Thomas...Bawdsey, Woodbridge
Edwards, G. Betham...Bredfield, Woodbridge
Everett, F. H....Sudbourne, Wickham Market
†Everitt, W. S....Carlton Colville, Lowestoft
†Fison, Albert J....Barningham Hall, Ixworth
Fison, Joseph...Ipswich
†Fowler, Robert C....Gunton Hall, Lowestoft
Freeman, John G....Aspall House, Debenham
French, Richard Day...St. John's, Bungay
Freuer, Alfred...Debenham, Ipswich
†Frost, Charles...Wherstead, Ipswich
†Gardiner, S....Wheatacre All Saints, Beccles
Garrard, Frank R....The Hall, Framlingham
Garrard, Robert..Brundish Grove, Wickham Market
†Garrett, Richard...Carleton Hall, Saxmundham
Gilstrap, Wm...Fornham Park, Bury St. Edmund's
Greene, Edward, M.P...Westgate, Bury St. Edmund's
Grimwade, Edward...Ipswich
Grout, John...Woodbridge
†Gurteen, Daniel...Haverhill
Guy, George F....Angel Hill, Bury St Edmund'
Harvey, William ..Timworth, Bury St.Edmund's
Harwood, Thomas...Belstead Hall, Ipswich
Haward, Robert...Mells Hill, Halesworth
†Hawkins, Thomas...Bentley Hall, Ipswich
Hayward, Frederick...Needham Market
Head, John...Ipswich
†Hempson, John A....Erwarton Hall, Ipswich
Henniker, Lord...Woodlands, Ipswich
Hervey, Lord A., M.P..Ickworth, Bury St.Edmund's
†Hodgson, E. G...Charsfield Hall, Wickham Market
Horton, Capt. W., R.N..Livermere, Bury St.Edmund's
†Jacobson, C. C....Whatfield, Ipswich
Jefferies, John R....Ipswich
Jillings, John...Little Saxham, Bury St. Edmund's
†Kerrick, John...Geldeston Hall, Beccles
†Kersey, William...Mason's Bridge, Raydon, Hadleigh
King, A. C..Desning Hall, Higham, Bury St. Edmund's
King, Walter John...Ipswich
King, W. N....Barton, Bury St. Edmund's
Le Butt, Josiah...Bury St. Edmund's
Lofft, R. E....Troston Hall, Bury St. Edmund's
†Lugar, Henry...Ingham, Bury St. Edmund's
Lungley, Brooke M....Peyton Hall, Boxford
†Mills, William...Saxham Hall, Bury St. Edmund's
†Mumford, Maurice...Creeting, Stowmarket
Nickerson, George...Barningham, Bury St. Edmund's
Oakes, Hervey A....Stowmarket
†Ogilvie, Alexander...Leiston, Saxmundham
Oldrin, John...Rushmere, Wangford
†Packard, Edward...Ipswich
†Packard, E., jun....Bramford, Ipswich
†Packe, Dr. J....Melton Lodge, Woodbridge
Paine, George J....Risby, Bury St. Edmund's
Palmer, George...Hawstead, Bury St. Edmund's
Parker, J. Oxley...Drinkstone, Woolpit
Parker, Lt.-Col. Windsor, M.P..Clopton Hall, Woolpit
Payne, George E....Badwell Ash, Ixworth
Peto, Lawrence J....17, Esplanade, Lowestoft
†Pettiward, R. J....Firborough Hall, Stowmarket
†Phillips, W. P. T....The Grange, Woodbridge
†Powell, T. Harcourt...Drinkstone Park, Woolpit
†Prentice, Manning...Stowmarket
†Pretyman, Arthur...Haughley Park, Stowmarket
Ransome, J. E....Bolton Hall, Ipswich
Ransome, Robert C....Ipswich
Read, Henry...London Road, Beccles
†Rendlesham, Lord...Rendlesham Hall, Woodbridge
†Roberts, Oscar W....Debenham
Rodwell, B. B. H..Ampton Hall, Bury St. Edmund's
†Sexton, G. Mumford...Wherstead Hall, Ipswich
Shaw, Rev. Morton...Rougham, Bury St. Edmund's
Smith, Alfred J....Rendlesham, Woodbridge
Smith, John F....Glemsford, Sudbury
†Steward, A. A....Rise Hall, Akenham, Ipswich
Sturgeon, Joseph...Norton Hall, Woolpit
†Talbot, H...Stanningfield Hall, Bury St. Edmund's
Tinning, John...Chillesford, Wickham Market
Toller, James...Blaxhall, Wickham Market
Toller, William...Gedgrave, Wickham Market
Turner, Edward R. T....Ipswich
Turner, Frederick...Ipswich
†Turner, George...Barnham (Thetford)
Turner, J. H....Little Horringer Hall, Bury St. Edmund's
Wallace, Sir R., Bart, M.P....Sudbourne Hall, Wickham Market
Walker, Thomas...Sutton Hall, Woodbridge
Ward, David...Melford, Sudbury
Warner, Edward...Stowmarket

Webb, Lancaster...Combs Tannery, Stowmarket
Wellingham, J....Gedgrave, Wickham Market
Wells, Henry...Occold, Eye
White, Rev. J....Chevington, Bury St. Edmund's
†Whiting, T. C....Barsham House, Beccles
Whitmore, William...Wickham Market
Wigston, Richard....Stonecroft, Bury St. Edmund's
Wilkinson, H. J....Walsham-le-Willows, Ixworth
Wilkinson, Captain T. H....Walsham, Ixworth
†Wilson, H. Maitland....Stowlangtoft, Bury St. Edmund's
Wilson, William...Baylham Hall, Ipswich
Wolton, H....Newbourn Hall, Woodbridge
†Wolton, S,...Butley Abbey, Wickham Market
Woods, E. Freeman...Stowmarket
†Woods, James...Stowmarket
Wright, Herbert...Ipswich
Youngman, Philip...Walsham-le-Willows, Ixworth

SURREY.

Governor.

Lovelace, Earl of..East Horsley Towers, Woking Stat.

Members.

†Amos, C. E..5, Cedars Rd., Clapham Common, S.W.
Armstrong, George...Thornton Heath
†Arnot, James...Woodcote, Carshalton
Bates, Robert Jackson..Ditton Hall Lodge, Kingston
†Beaumont, J. A....Park House, Wimbledon
Bennett, Rev. H. Leigh...Thorpe, Egham
†Best, J. V...32, Guildford Rd., South Lambeth, S.E.
Bigg, T....Leicester House, Great Dover Street, S.E.
†Birch, George Francis...Clare Park, Farnham
†Blenkinsop, James...Egham
Bosanquet, S. Courthope...Tanhurst, Dorking
Botly, William...Salisbury House, Upper Norwood
†Bradshaw, John...Knowle, Cranleigh
†Breach, J. G....Upper Richmond Road, Putney
Bridgland, Stephen...Sunnybank, Mitcham
Briggs, Thomas...The Homestead, Richmond
Briginshaw, William...Bagshot Park
†Bushby, H. J....Henleaze, Kingston Hill
Cabrera, General...Wentworth, Chertsey
†Cardwell, E. H....Hill Side, West Horsley
Chadwick, E., C.B....Park Cottage, East Sheen
Chitty, Edward...Guildford
Clowes, George...Oakhill, Surbiton
Clutton, Robert...Hartswood, Reigate
†Coles, Alfred...Clifton Lodge, Clapham Park
Combe, R. H....Pierrepont, Frensham, Farnham
†Corbett, Captain R. J....Moore Place, Bletchworth
Coussmaker, Lannoy...Westwood, Guildford
Currey, Charles Herbert...Weybridge Heath
Curzon, Hon. S. C. H. R....Grove House, Tooting
Devas, Thomas...Mount Ararat, Wimbledon
Drewit, Thomas...Piccard's Farm, Guildford
†Drewitt, William...Lea Farm, Bramley, Guildford
†Ellis, John...Artington, Guildford
†Faviell, W. F....Down Place, Guildford
†Fenning, Herbert S....Gatton, Reigate
Fletcher, John...Merton Hall Farm, Merton
†Forster, Samuel...Southend, Sydenham
Franks, James...Bramley, Guildford
Fuller, Robert Willes...Croydon
Gadesden, Augustus W....Ewell Castle
Giles, F. Thresher..Marsh House, Bentley, Farnham
Goodson, William...Hill Farm, Mitcham
†Gossett, Major Arthur...West Park, Mortlake
†Gower, Granville W. G. L....Titsey Park, Godstone
Grantley, Lord...Wonersh Park, Guildford
†Grissell, Thomas...Norbury Park, Dorking
Hales, Edward...The Waldrons, Croydon
Hall, Charles...Brickwood Villa, Croydon
Harbord, Collet...Cranleigh, Guildford
Healey, E. C....Wyphurst, Guildford
Heath, Admiral Sir Leopold George, K.C.B....Austie Grange, Holmwood
Hepburn, Thomas...Clapham Common
†Hicks, Sir Francis Bart....Oakfield, Streatham Hill
†Hicks, Thomas...Holmewood, Streatham Hill
†Hipwell, G. M....Elmore Lodge, Sutton
Hodges, James J....Penny Hill, Bagshot
†Hodgson, J. Stewart...Denbigh, Haslemere
†Hughes, Frederick...Wallfield, Reigate
†Hulse, Charles...Stoke Park, Guildford
Hunter, Lt.-Col...Farquhar Road, Upper Norwood
†Johnson, Cuthbert W.... Waldronhurst, Croydon
†Kesterton, Thomas...Sutton
King, Hon. J. P. Locke...Woburn Park, Chertsey
†Lambert, Henry T....Sandhills, Bletchingley
†Langton, George...2, Northfield Villas, Wandsworth
†Langton, John...Wandsworth
Lascelles, F. H....Mayfield, Rawledge, Farnham
Lees, John...Reigate
†Lefroy, C. J. Maxwell...Crondall, Farnham
Linley, William...Ham Common
McCullock, David...Galton Park, Reigate
†MacNiven, Charles...Perrysfield, Oxted
†Martin, E. Waterer...Nonsuch Park, Ewell
†Master, C. Hoskins...Barrow Green House, Godstone
Masterman, T. W....4, Spencer Hill, Wimbledon
†Michell, E. W., jun..Halken, Queen's Rd., Richmond
†Morris, Norman...Ford, Lingfield
†Murray, A...16, Spencer Terrace, Clapham Junction
Musgrave, Rev. Vernon...Hascombe, Godalming
Newton, John...Manor Road, Bermondsey, S.E.
Northey, E. R....Epsom
Ord, George...Brixton Hill
Overton, John, jun....Sutton Lodge, Sutton
†Paine, Mrs....Farnham
†Paine, W. Dunkley...Cockshutt Hill, Reigate
Pennington, Frederick, M.P....Broome Hall, Dorking
Pigot, Sir R., Bart...West Hall, Byfleet, Weybridge
Pinckard, G. H....Coombe Court, Godalming
Pochin, H. D....Barn Elms, Barnes
Puckle, T. B....Woodcote Grove, Carshalton
†Punnett, P. S....Park Hill Road, Croydon
†Ramsden, J. C....Busbridge Hall, Godalming
Ranford, Charles, New Weston St., Bermondsey, S.E.
Rastrick, George...Woking Lodge, Woking Station
Rayner, Captain...Beulah Hill, Upper Norwood
†Roberts, C. Gay...Shottermill, Haslemere
†Ross, Owen C. D....Little Bookham, Leatherhead

†Rowcliffe, E. Lee...Cranleigh, Guildford
Sadler, Thomas...Chiddingfold
Sawyer, Henry G....Richmond Park
†Scott, William C....Thorpe, Chertsey
Seager, J. Lys..Carroun House, South Lambeth, S.E.
†Shaw, John...Beddington Lodge, Croydon
Simpson, George...Wray Park, Reigate
Steere, Lee, M.P....Jayes Park, Dorking
†Stevens, Alfred Henry...Farnham
Still, Henry...Chelsham, Croydon
†Stilwell, J J R....Killinghurst, Haslemere
Sutherland, C. Leslie...Coombe, Croydon
†Taber, John...Herne Hill
†Thurlow, T. Lyon...Baynard Park, Guildford
Walker, Marmaduke...Addington Lodge, Croydon
Ware, James T....Tilford House, Farnham
Waterer, Anthony...Knapp Hill, Woking
Wetton, Henry...Chertsey
†White, A. Holt...St. Mary's Grove, Richmond
†Wigsell, Captain...Sanderstead Court, Croydon
Wise, Henry...Feltons, Brickham, Reigate
Woolloton, Charles...Elstree, Nutfield
Woolnough, Charles...Ceres Iron Works, Kingston-on-Thames
Woolnough, William...Kingston-on-Thames

SUSSEX.

Governors.

Allison, Arthur...Tilgate Forest Lodge, Crawley
Chichester, Earl of...Stanmore Park, Lewes
Curteis, Major Edward Barrett...Leesam House, Rye
†Freeland, H. W....Chichester
†Leconfield, Lord...Petworth House
Montefiore, Joseph Meyer...Worth Park, Crawley
†Richmond, Duke of, K.G....Goodwood, Chichester
†Shadwell, Lucas...Fairlight, Hastings

Members.

†Aldridge, Major J....St. Leonard's Forest, Horsham
†Baker, William H....Brooklands, Worthing
Bannister, Thomas...Limehurst, Hayward's Heath
Bannister, William...West Dean, Lewes
Barchard, F....Horsted Place, Uckfield
Baring, John...Oakwood, Chichester
Bennett, Sir J..The Banks, Mountfield, Hurst Green
Blencowe, John George...Binenam, Lewes
Braby, James...Maybanks, Rudgwick, Horsham
†Brander, R. B...Tanbridge House, Horsham
Brook, A. Sawyer...Bexhill, Hastings
†Brown, Thomas...Ashdown Forest, Uckfield
†Brydone, H. Gray...Petworth
Bunny, Major Edward John...Slinfold, Horsham
Caffin, Peter...Hazelwick, Crawley
†Carew-Gibson, G. C... Sandgate Lodge, Pulborough
†Cavendish, Lt.-Col. W. H. F..West Stoke, Chichester
Cheesman, F. W....Morley, Northiam (Hawkhurst)
†Clay, J. S...Ford Manor, Longfield, East Grinstead
†Collyer, A. T....Newland, Keymer, Hurstpierpoint
†Coppard, T....Lanehurst Lodge, Hurstpierpoint
Courthorpe, G. C....Whiligh, Hurst Green
Currie, Edmund...West Burton House, Petworth
Day, John...Newick Lodge, Uckfield
†Dennett, Mullens...Lodsworth, Petworth
†Dickens, Charles Scrace...Coolhurst, Horsham
Dodd, Henry...The Hall, Rotherfield
†Drewitt, George...Oving, Chichester
†Drewitt, Charles J....Drayton, Chichester
†Drewitt, John...North Stoke, Arundel
†Drewitt, John, jun....Patching, Arundel
†Drewitt, R. Dawtrey...Peppering, Arundel
Dumbrell, James...Ditchling
Ellis, Charles...Preston House, Beddingham, Lewes
Ellis, Philip H....Northiam, Lewes
†Ellman, R. H....Landport, Lewes
Elwes, H. T....West Hoathley, East Grinstead
Emery, R. Coleman...Hurston Place, Storrington
Evershed, Henry...Hallingby
†Ferard, Charles...21, Palmeira Square, Brighton
Fitzhugh, Rev. William...Street, Lewes
†Gates, Richard...7, Sussex Place, Horsham
Gee, Thomas...Dewhurst Lodge, Wadhurst
Gilbey, Walter...Adelaide Mansions, Brighton
†Gonne, Charles...Robertson Terrace, Hastings
†Gorringe, Hugh...Southwick, Shoreham
†Grantham, George...Barcombe Place, Lewes
†Gray, Frederick...Pippinford Park, Uckfield
Hale, Bernard...Holly Hill, Hartfield
Hallett, Major F. F....The Manor House, Brighton
Hampton G....North End, Washington, Pulborough
Hanning, J...Little Oat Hall, Burgess Hill
Hardwick, Alfred...Hangleton, Portslade
Hart, Henry P....Beddingham, Lewes
†Hawkshaw, Sir John...Hollycombe
Heasman, Alfred...Rustington, Littlehampton
Henry, Captain J....Blackdown House, Petworth
Hersee, Miss...Westgate, Chichester
†Hill, Lord Arthur...Wakehurst, Hayward's Heath
†Hubbard, W. Egerton...St. Leonards, Horsham
†Hume, C. Trevor...The Rectory, St. Leonards
Humphrey, Henry...Ashington, Hurstpierpoint
Hussey, Edward...Scotney Castle, Lamberhurst
†Hussey, R. H....29, Brunswick Terrace, Brighton
†Jenner, George...Parsonage House, Udimore, Rye
Jollands, W. D....Buxshalls, Lindfield
†Kennedy, William...89, Marine Parade, Brighton
Kent, John...Whyke, Chichester
†Laurie, R N....Pax Hill Park, Cuckfield
Lucas, J. Clay...Lewes
†Luttman, Johnson J....Cylinder (Petworth)
Lyon, William...Charlwood, Crawley
†Macnaghten, Robert...Ovingdean, Brighton
†Madgwick, William...Alciston, Lewes
Mannington, C....Morley Farm, Battle
Mannington, W....Laughton Place, Hurst Green
†Mannington, W...The Abbey Farm, Robertsbridge
†Margary, Major...Chartham Park, East Grinstead
†Mitford, W. Townley, M P....Pitshill, Petworth
Napper, John...Ifold, Horsham
†Nottidge, Josias...Iden Rectory, Rye
Oastler, Jonah...Alfold, Horsham
Papillon, Thomas...Crowhurst Park, Battle
Peachey, William...Ebernoe, Petworth
†Piper, Edward...Northiam Place, Northiam

†Pipon, Captain...Deerswood, Crawley
†Pratt, Major...Somers, Billingshurst
Pronger, James...Crawley
†Raikes, G. W...Portslade Cottage, Shoreham
Ratcliffe, R....Standard Hill, Ninfield, Battle
Reeves, J. R....Huntsland, Crawley Down
Rigden, William...Hove, Brighton
Rosseter, R. M ...Manor House, Iford, Lewes
Rowley, Hon. R. T....Ruster Nunnery, Horsham
Rumbold, C. J. A....5, Percival Terrace, Brighton
Sadler, R. Stebbing...Park Farm, Bolney, Cuckfield
†Saunders, W. Wilson..2, Selden Terrace, Worthing
Sampson, Thomas...Moor Hall, Battle
Sheffield, Earl of...Sheffield Park, Uckfield
†Simes, N. P....Stood Park, Horsham
Smith, Martin S....Colwood Park, Hayward's Heath
Speaker, Right Hon. The...Glynde, Lewes
Stanford, Alfred...Eatons, Ashurst, Steyning
Stanford, Edward...Ashurst, Steyning
Stanford, William...Charlton Court Farm, Steyning
Tallant, Francis...Easebourne Priory, Midhurst
Taylor, William...Glynley, Westham
Templeton, Andrew...West Dean Park, Chichester
Thompson, T. C....Ashdown Park, East Grinstead
†Tulloch, Wm....Slaugham Park, Crawley
†Turner, Frank...North Bersted, Bognor
Turner, J. Singer...Chyngton Farm, Seaford,
†Upperton, Robert...35, Steyne, Brighton
Upton, Henry...Aldwick, Bognor
Verrall, R. Relfe...Falmer, Lewes
Vickress, Edward...Newbridge Farm, Billingshurst
†Warner, Thomas...47, Sussex Square, Brighton
†Warren, R. A....Preston Place, Arundel
Waters, Benjamin...Motcombe, Eastbourne
†Watson, J. G....East Hoathley (Hawkhurst)
Watson, Robert...Standard Hill, Ninfield, Battle
Webster, Frederick...Marley Farm, Battle Abbey
Willett, G. W....2, Royal Crescent, Brighton
†Wood, James...Ockley, Hurstpierpoint
Wood, William...Ifield Court, Crawley
Woolnough, C....Ashdown Farm, East Grinstead

WARWICKSHIRE.

Governors.

Aylesford, Earl of....Packington Hall, Coventry
Hertford, Marquis of...Ragley Park, Alcester
†Howe, Earl...Gopsall, Atherstone
†Leigh, Lord...Stoneleigh Abbey
†Muntz, G. F....Umberslade Park, Birmingham
†Warwick, Earl of...Warwick Castle

Members.

†Adderley, Rt. Hon. C.B., M.P..Hams Hall, Minworth
Addison, John...Hodnell, Southam
Adkins, G. C....The Lightwoods, Birmingham
Adkins, Henry...The Firs, Edgbaston, Birmingham
†Allfrey, H.W...Hemingford Ho., Stratford-on-Avon
Arnold, Ralph...Shackerstone, Atherstone
Ashby, Captain G. A....Naseby Woolleys, Rugby
Ashwin, Manley C....Stratford-on-Avon
Bacon, Samuel...Ratcliffe Culey, Atherstone
Baker, William...Moor Barns, Atherstone
†Baldwin John...Luddington, Stratford-on-Avon
Barrs, Mrs. M...Odstone Hall, Atherstone
†Bassett, R. K....Whitby Abbey Farm, Coventry
Bennett, John Ewins...Bosworth Grange, Rugby
Benson, C....98, Bull Street, Birmingham
Blyth, T. P....The Fields, Southam, Rugby
Bolden, S. E ...Bilton Road, Rugby
†Bomford, H. B....Exhall Court, Alcester
Bomford, H. J....Dunnington, Alcester
Boultbee, John...Emscote Manor House, Warwick
Bourne, William...Atherstone
Brierly, Harry, jun....Church Lawford, Rugby
†Bright, John...Bath Row House, Birmingham
Bromfield, Henry...Flint Hall, Wellesbourne
Bromwich, Thomas...Woolston, Coventry
Bucknill, John C., M.D....Hillmorton Hall, Rugby
Burbury, John...Wootton Grange, Kenilworth
Burbury, Joseph H....Montague House, Kenilworth
Burbury, W. P...Croft's Farm, Stratford-on-Avon
†Butler, Hon. C. L....Coton House, Rugby
Caldecott, C. M....Holbrook Grange, Rugby
†Caldecott, Thomas...Rugby Lodge, Rugby
Canning, George H....Shottery, Stratford-on-Avon
Canning, Samuel...Snitterfield, Stratford-on-Avon
Chambers, Clifford...Milcote, Stratford-on-Avon
†Chattock, H. H...Solihull
Clare, W. Harcourt...Twycross, Atherstone
Cobb, Frederick...Walton, Warwick
Cocks, Charles...Hamstead, Birmingham
†Congreve, S. B....Harbors Magna, Rugby
†Cooper, W. Synge...Hillmorton Paddox, Rugby
Corbett, C....Broad Marston, Stratford-on-Avon
†Couchman, C....Temple Balsall, Birmingham
†Cowley, W. Payne...Ashby St. Ledgers, Rugby
Cowper, Robert...Wolverton, Stratford-on-Avon
Crofts, John...Long Lawford Hill, Rugby
†Davis, Francis C....Whichford, Long Compton
Donne, Henry...Leek Wootton, Warwick
†Elkins, John Francis...Yelvertoft, Rugby
†Elkins, William...Elkington, Yelvertoft, Rugby
†Elwell, John...Timberley, Castle Bromwich
Evans, Isaac Pearson...Griff, Nuneaton
†Fardon, H. F....7, Braithwaite Road, Birmingham
†Fisher, H. L...Hilborough, Alcester
Fletcher, Bell, M.D..Dorridge Ho., Knowle, Birmingh.
Ford, John...Portland Lawn, Leamington
†Forrest, Samuel...The Chase, Kenilworth
†Galton, Darwin...Claverdon Leys, Warwick
Gardner, John...Twycross, Atherstone
Garner, Charles C....The Wolds, Snitterfield, Stratford-on-Avon
†Gee, John...Welford, Rugby
†German, William...Measham Lodge, Atherstone
Gillott, T. L....Broadgate, Coventry
Glover, J. W....Eagle Works, Warwick
Greenway, G. C...Binswood Cottage, Leamington
†Grimes, W. H....Bubbenhall, Kenilworth
Hamer, Charles M....Snitterfield, Stratford-on-Avon
†Hamilton, Sir R. N. C., Bart., K.C.B...Avon Cliffe, Stratford-on-Avon

†Hammerton, George...Princethorpe, Rugby
Hands, Lawrence...Baginton, Coventry
Hands, Thomas...Canley, Coventry
Harrison, J. Clarke...Pailton Fields, Rugby
Hartopp, Sir J., Bt....Fair Oaks Hall, Sutton Coldfield
Henniker, Captain T. H...Bulkington, Rugby
Hicken, John...Dunchurch, Rugby
†Hodgson, Arthur...Clopton House, Stratford-on-Avon
Hopwood, Benjamin D....Birmingham
Horley, Thomas, jun....The Fosse, Leamington
Howman, Henry A....Halloughton, Coleshill
Hurlston, William...Heathcote, Wasperton
Hutchings, William...Stratford-on-Avon
†Izon, J. B ...Walsgrave-on-Sowe, Coventry
Jenkyns, Arthur...Upton, Nuneaton
Jones, George...Starton, Kenilworth
†Jones, J. C....Loxley, Warwick
Kemp, Joseph...Oakenend Farm, Allesley, Coventry
King, John...Rowington, Warwick
Lea, Henry...35, Paradise Street, Birmingham
Lea, Richard N....Bristol Road, Birmingham
Lloyd, Thomas...Warwick
†Lovell, Thomas...Winwick Warren, Rugby
Low, John.. Whitmore House, Birmingham
Luckcock, Howard...Edgbaston, Birmingham
†Lythall, F....Radford Hall, Leamington
Lythall, John B....Bingley Hall, Birmingham
Malcolm, Matthew...Manor House, Kineton
Manley, Major...Mancetter Lodge, Atherstone
Mapplebeck, W. B....Bull Ring, Birmingham
Margetts, John...High Street, Warwick
†Mathews, Jeremiah...Edgbaston, Birmingham
†Mills, J. Truman...Husband's Bosworth, Rugby
Milne, Oswald, jun....Leamington
Minett, Junius E . Llowley Hall, Fillongley, Coventry
†Minton, T. S....Good Rest, Warwick
Moore, George...Appleby Hall, Atherstone
Moore, John...Church Street, Warwick
†Morrice, John W....The Tower, Calthorpe, Rugby
†Mott, C. J....Clifton-on-Dunsmore, Rugby
Moxon, T. David...Easenhall, Rugby
†Nelson, Charles...Crackley, Kenilworth.
Nelson, George H....The Lawn, Warwick
Newdigate, C. N., M.P....Arbury, Nuneaton
Newton, T. H. G....Barrells Park, Henley-on-Arden
†Norman, John N....Harboro' Magna, Rugby
†Nutt, John...White House, Fillongley, Coventry
Parsons, C. W....Anstrey, Atherstone
Pennington, Richard...Westfield House, Rugby
Petre, Edward...Whitley Abbey, Coventry
Ratcliffe, T....Norton House, Sheepy, Atherstone
Reading, William...Ashorn, Leamington
†Rigg, Joseph...Fillongley, Coventry
†Riley, Luke...Meriden, Coventry
Robbins, Richard...Kenilworth
Ryland, Thomas..Gt. Lister St. Works, Birmingham
Satchwell, Thomas..Hernfield, Knowle, Birmingham
Savidge, John...Gopsall Farm, Atherstone
†Scriven, Edward..Wormleighton Hill, Leamington
Senhouse, Captain W....Ashby St. Ledgers, Rugby
Seymour, Lord Ernest J....Kingley, Alcester
Seymour, R. A....Kinwarton Rectory, Alcester
Sharp, Henry...Packington, Coventry
Simpson, Samuel M....Stoneleigh, Kenilworth
Smith, Alfred...Great Barr, Birmingham
Smith, F. D. Lea...Halesowen Grange, Birmingham
Smith, George... Ailston House, Stratford-on-Avon
Smith, Henry...Pinwall Hall, Atherstone
Smith, John...Gorse Farm, Great Barr, Birmingham
Smith, Joseph...Henley-in-Arden
†Smith, W. B....Beauchamp Terrace, Leamington
Smithson, G. ...63, Wellington Road, Birmingham
Spencer, John...Villiers Hill, Kenilworth
Staite, John...Leamington Priory, Warwick
Steedman, George...Hall Green, Birmingham
†Stilgoe, Henry...Lower Clapton, Stratford-on-Avon
†Swinnerton, W. W....Styvechall Grange, Coventry
†Tangye, Richard...Birmingham
Taverner, Joseph W....Shelford Manor, Nuneaton
Tipper, B. C....Bristol Road, Birmingham
†Tomes, R. F....Weston, Stratford-on-Avon
†Tomes, W. B....Weston Sands, Stratford-on-Avon
Townshend, Captain H....Caldicote Hall, Nuneaton
Tyndall, F. T....Edgbaston, Birmingham
†Tysoe, Samuel...Rumer Hall, Stratford-on-Avon
†Umbers, Edward...Wappenbury, Leamington
Villiers, Lady E...Serlby Hall, Husband's Bosworth, Rugby
Wakefield, W. T....Fletchamstead Hall, Coventry
Wallington, George...Little Hill, Wellesbourne
Watkin, John...Oil Mill, Leamington
†Welchman, F. R....Southam
West, J. R....Alscot Park, Stratford-on-Avon
†Weston, James...Kerseley House, Coventry
Whitmell, J. J....Silsworth Lodge, Rugby
Winn, John R....Lower Coundy, Coventry
Wise, George...Woodcote, Warwick
Wollaston, Major...Shenton Hall, Nuneaton
Wood, James...Ratcliffe Culey, Atherstone
†Wood, John...Welford, Rugby
Wood, Thomas...Grendon Fields, Atherstone
Wright, John...Fen End, Knowle, Birmingham
Yates, Francis H....Great Barr, Birmingham

WESTMORELAND.

Governor.

Bective, Lord...Underley Hall, Kirby Lonsdale

Members.

†Argles, F. Atkinson...Eversley, Milnthorpe
†Arnold, Harry...Arnbarrow, Milnthorpe
Atkinson, William...Burnside Hall, Kendal
†Banks, John Jackson...Kendal
†Braithwaite-Wilson, C...Plumtree Hall, Milnthorpe
Browne, George...Troutbeck, Windermere
†Brunskill, Stephen...Sand Area, Kendal
†Burrow, Robert...Wrayton Hall, Kirkby Lonsdale
Close, James...Holmescales, Milnthorpe
Close, Jarvis...Smardale Hall, Kirkby Stephen
Cropper, James...Ellergreen, Kendal
Crosby, John...Breaks Hall, Appleby
Dixon, Thomas...Dalton, Burton

Fell, W. A.... Windermere
Fenton, David Henry...70, Strickland Gate, Kendal
Fulton, A ...Sedgwick, Kendal
†Gandy, Captain H....Castle Bank, Appleby
Gandy, Lieut.-Colonel...Heaves, Milnthorpe
†Gibson, Joseph...Whelprigg, Kirkby Lonsdale
†Handley, William...Greenhead, Milnthorpe
†Harris, Alfred...Lunefield, Kirkby Lonsdale
†Harrison, Daniel...Kendal
Harrison, John...Nether Levens, Milnthorpe
†Harrison, John...Summerlands, Kendal
†Harrison, T. J....Singleton Park, Kendal
Hoggarth, Henry...Kendal
Holme, John...Park Side, Milnthorpe
Johnson, Henry, jun....Kendal
†Keightley, A. D....Old Hall, Milnthorpe
Knight, Richard...Gilthwaiterigg House, Kendal
Long, A. W....Mint Cottage, Kendal
†Lowther, Hon. William, M.P....Lowther Castle
Metcalfe, Anthony...Ravenstonedale, Tebay
Milne, Alexander...Lawrence House, Milnthorpe
Morton, John...Skelsmergh Hall, Kendal
Nicholson, John...Kirkby Thore Hall
Parker, Francis...Acorn Bank, Templesowerby
Parker, Rowland...Moss End, Burton
†Punchard, F....Underly, Kirkby Lonsdale
†Redmayne, Giles...Braythay Hall, Ambleside
Rooks, James...High Barns, Milnthorpe
Scott, Samuel...Lane House, Burton
†Staniforth, Rev. T....Storrs Hall (Windermere)
Stavart, W....Helsington Laiths, Kendal
†Swainson, Joseph, jun....Kendal
Swinglehurst, Henry...Kincaster House, Milnthorpe
Talbot, John...Milnthorpe
Tattersall, William...St Anthony's, Milnthorpe
Taylor, Richard...New House, Kendal
Thompson, James...Castle Meadows, Kendal
†Thompson, William...Moresdale Hall, Kendal
Wakefield, W....Birklands, Kendal
†Wakefield, William Henry...Sedgwick, Kendal
Webster, Crayston...Kendal
Whitwell, John, M.P....Bank House, Kendal
†Wilkinson, Charles...Bank House, Kendal
Williamson, Benjamin...Kendal
†Wilson, C. H....Rigmaden, Kirkby Lonsdale
†Wilson, Christopher W....Oxenholme, Kendal
†Wilson, George E ...Dallam Tower, Milnthorpe
Wilson, James...Crossthwaite, Milnthorpe
Wilson, Thomas...Cunswick Hall, Kendal
Yeates, G. H B....Brettargh Holt, Milnthorpe

WILTSHIRE

Governors.

Ailesbury, Marquis of...Savernake Forest, Marlborough
†Bath, Marquis of...Longleat, Warminster
Cowley, Earl...Draycot House, Chippenham
†Morrison, Alfred...Fonthill House, Hindon
Neeld, Sir John, Bart....Grittleton, Chippenham
Radnor, Earl...Longford Castle, Salisbury

Members.

Affleck, William...Swindon
Allen, James D....Tisbury, Salisbury
Andrews, Henry...Little Longford, Heytesbury
†Arkell, Thomas...Pen Hill Farm, Swindon
Attwater, J. Gay...Britford, Salisbury
Bathurst, Lieut.-Col....Clarendon Park, Salisbury
Beaven, James...West Leaze Farm, Swindon
Bell, J. Askew...Durley, Savernake Forest
Blathwayte, G. W....Dyrham, Chippenham
Bolam, C. G....Savernake Forest, Marlborough
Bouverie, Right Hon. E. P....Manor House, Market Lavington
Brown, George...Avebury, Calne
Brown, J. Washbourne...Uffcott, Swindon
†Brown, Thomas...Horton, Devizes
Brown, William...Devizes
Brown, W. J....Hazlebury House, Chippenham
Buckwell, Francis...Little Badminton, Chippenham
†Butler, Paul...Down Ampney House, Cricklade
†Butler, William...Badminton, Chippenham
Clark, Isaac...Heddington, Calne
Clarke, J. S....Ashwick's Grange, Chippenham
Coles, Robert...Middleton Farm, Warminster
Dangan, Viscount...Draycott House, Chippenham
†Day, William...Woodyates, Salisbury
†Ferris, T....Manningford Bohune, Pewsey
†Ferris, W....Manor House, Milton, Pewsey
Filliter, S. F....Banton Farm, Bishops Canning
Finch, W. C ...Bemerton Lodge, Salisbury
†Freke, A. D. Hussey...Hannington Hall, Highworth
Goddard, H. N.. Manor House, Cliffe, Wootton Bassett
Goddard, W. Gilbert...Broad Chalk, Salisbury
Godwin, Robert...Water Eaton, Cricklade
Graves, Albert B ... Charlton House, Ludwell, Salisbury
†Grimwood, G....Stanton House, Highworth
†Hanbury, Edgar...Eastrop Grange, Highworth
Harding, William...Cranborne, Salisbury
Hatherell, J. C....Oldbury-on-the-Hill, Chippenham
Hayter, Tom John...West Woodgates, Salisbury
Hewer, William...Sevenhampton, Highworth
†Heytesbury, Lord...Heytesbury.
Hobbs, Charles...Maisey Hampton, Cricklade
Humby, J. H....Charlton Farm, Salisbury
†Ingram, John A....Wylye, Heytesbury
†Jones, H. P....Portway House, Warminster
Knatchbull, Rev. W....Cholderton Lodge, Amesbury
Lane, Ebenezer...Honey Street, Marlborough
†Lansdowne, Marquis of...Bowood, Calne
Law, Rev. R. V....Christian Malford, Chippenham
Little, Edward...Lan Hill, Chippenham
†Long, Richard P....Rood Ashton, Trowbridge
Ludlow, H. G. G....Heywood House, Westbury
Lywood, Edwin...Maddington, Devizes
Marshall, H. J....Poulton Priory, Cricklade
May, Charles Neale...Devizes
†Merriman, Edward B....Marlborough
†Merriman, Thomas B....Marlborough
†Merriman, William C....Marlborough
Methuen, Lord...Corsham Court, Chippenham
Middleditch, E. T....Blansdon House, Swindon

Morgan, R. T....Brook House, Cricklade
†Miles, Charles W....Burton Hill, Malmesbury
Newton, William...Dogdean, Salisbury
Parham, James N....Sutton Veney, Warminster
†Parkyns, Sir T. G. A., Bart. ... Harnham Cliff, Salisbury
†Parry, Joseph...Allington, Devizes
†Pembroke, Earl of...Wilton House, Salisbury
†Phipps, C. P....Chalcot House, Westbury
Picton, Robert...Box, Chippenham
†Pollen, R. H....Radbourne, Chippenham
Powell, John Thomas...Easton, Pewsey
†Poynder, T. H. A....Hartham Park, Corsham
†Prodgers, Herbert...Kington House, Chippenham
Rawlence, James...Bulbridge, Wilton, Salisbury
Read, James...Salisbury
Reeves, Robert...Bratton, Westbury
Rigden, R. H....Salisbury
Ruck, Edmund...Castle Hill, Cricklade
†Sadler, James H....Purton Court, Purton
Sainsbury, W....Hunt's House, West Lavington, Devizes
†Saunders, T. B....The Priory, Bradford-on-Avon
†Smith, R. Sadler...Durrington, Salisbury
Somerset, John...Milton, Pewsey
Spencer, John...Bowood, Calne
†Spicer, J. W. Gooch...Spye Park, Chippenham
Squarey, Elias P....Odstock, Salisbury
†Stanton, Rev. J. J....Tockenham, Wootton Bassett
†Storrar, Robert...Grittleton, Chippenham
†Stratton, Joseph...Alton Priors, Marlborough
Stratton, W....Kingston Deverill, Warminster
Suffolk, Earl of...Charlton, Malmesbury
Taunton, William...Redlynch, Salisbury
†Taylor, S. Watson...Erlestoke Park, Devizes
†Thompson, John...Badminton, Chippenham
Williams, Charles...Salisbury
†Wood, W. Bryan...Branbridge, Chippenham
Yonge, Rev. W. J....Rockbourne, Salisbury

WORCESTERSHIRE.

Governors.

†Beauchamp, Earl. Madresfield Court, Great Malvern
D'Aumale, H.R.H. the Duke. Wood Norton, Evesham
Fetherstonhaugh, Joseph...Hopton Court, Worcester
†Knight, F. Winn, M.P....Wolverley, Kidderminster

Members.

Allsopp, Henry, M.P....Hindlip Hall, Worcester
Amphlett, John...Clent, Stourbridge
Ashmore, John...Norton, Evesham
†Ashton, T. Henry...Temple Laugherne, Worcester
†Bailey, Henry James...Rosedale Farm, Tenbury
Baker, Thomas...Blackstone, Bewdley
Barker, David Wilson...Mayfield House, Worcester
†Barneby-Lutley, J. H....Brockhampton, Worcester
†Barrows, Colonel...The Birches, Hagley, Stourbridge
Baumgarten, Captain E. P....Netherley, Malvern
†Bearcroft, E....Mere Hall, Droitwich
Best, James, jun....Hill Top, Tenbury
Blick, John...Hill Court, Droitwich
Bomford, Benjamin...Pitchill, Evesham
Boucher, A. E....Wolverley, Kidderminster
†Boulter, Thomas...Shenstone House, Kidderminster
Bramwell, Henry...Crown East Court, Worcester
Brewster, Richard...Heathy Mills, Kidderminster
†Brown, W. H....Belbroughton, Stourbridge
†Buck, Albert...Sansome Terrace, Worcester
Buckley, James...Hewell Lane Farm, Bromsgrove
Bull, J. H. W....Great Wolford, Shipston-on-Stour
Burlingham, Henry...Lansdown, Evesham
Chamberlain, Henry...Bredicot Court, Worcester
Colvile, General...Kempsey House, Worcester
Cooke, William H....Skelsley Kings, Worcester
Cookes, John R....Wood Hampton House, Stourport
†Corbett, John...Stoke Works, Bromsgrove
†Corbett, W. A....Dumbleton, Evesham
Coventry, Earl of...Croome Court, Kempsey
Curtler, T. G....Bevere House, Worcester
†Davies, John J....Grimley, Worcester
†Davis, Peter...Dean Park, Tenbury
Davis, Stephen...Woolashill, Pershore
†Davis, Thomas Henry...Orleton, Tenbury
Dorrell, Thomas...Bishampton, Pershore
Downing, I....Turner's Hill, Rowley Regis, Dudley
Downing, J. Marshall...Dowles, Bewdley
Dudfield, Benjamin, jun....Catsley, Kinlet, Bewdley
†Dun, Finlay...Weston Park, Shipston-on-Stour
†Evans, E. Bickerton...Whitbourne Hall, Worcester
Fardon, J. A....Witton House, Droitwich
†Firmstone, W. F...Churchill Court, Kidderminster
Gilbert, Joseph...Evesham
†Giles, John...Chaddesley Corbet, Kidderminster
Goodwin, Frederick...Britannia House, Worcester
Gough, Ashwin D...Sedgeborrow Hall, Evesham
Grazebrook, George...Stourbridge
Green, John...Heath Grange, Worcester
Gresley, Robert A....High Park, Droitwich
Griffin, George...Torton, Kidderminster
Guilding, Richard...Brick Barns, Malvern Wells
Halford, Thomas...Newbold, Shipston-on-Stour
Hall, Benjamin...Wood Farm, Malvern Wells
Hampton, Lord...Westwood Park, Droitwich
Hancocks, Captain A. T....Wolverley Court, Kidderminster
Hancox, Edward O....Evesham
Hardy, Peter...The Grange, Claines, Worcester
Harris, Thomas...Stonylane, Bromsgrove
Harward, John...Winterfold, Kidderminster
Haviland, Rev. J....Fladbury Rectory, Pershore
Haywood, E. W....Sillins, Redditch
Hemming, Richard...Bentley Manor, Bromsgrove
Herring, Henry...Caldwell Farm, Kidderminster
Higginbotham, John...Pensax Court, Tenbury
Hill, John...Severn Stoke, Worcester
†Hill, Thomas R....Catherine Hill House, Worcester
Holder, William..Yemston, Upper Sapey, Worcester
Hollins, Samuel...Sion House, Stourbridge
Holtom, W. F....Cleeve Prior, Evesham
†Hornyold, J. V...Blackmore Park, Upton-on-Severn
Humphries, E....Pershore
Hunt, George...Avon View, Evesham

Lakin, Henry...Link End, Malvern
Larkworthy, J L ...Worcester
†Lechmere, Sir E. A H , Bt , Rhyd Ct , Upton-on-Severn
Lett, John...Stone Court, Kidderminster
Lett, William...Rushock, Droitwich
Lloyd, Robert...Offmore, Kidderminster
†Lord, Captain J. P ...Hallow Park, Worcester
Lunn, Robert...Norton, Evesham
Lyttelton, Lord...Hagley, Stourbridge
Lyttelton, Hon C. G ...Hagley, Stourbridge
†Lyttelton, Hon. Robert H....Hagley Hall, Stourbridge.
M'Cann, George...Court Farm, Malvern
†McLaughlin, W. G....Boraston, Tenbury
Martin, G. E....Ham Court, Upton-on-Severn
Middlemore, Colonel...Thorngrove, Worcester
Middlemore, Mrs....Thorngrove, Worcester
†Midgley, W. H....St. Cuthbert's, Great Malvern
†Moore, Henry...Elmley Castle, Pershore
†Moseley, Captain W. H....Leaton Hall, Stourbridge
†Munn, Frederick...Holt Castle, Worcester
Myatt, James...Offenham, Evesham
†Mynors, R....Weatheroak, Alvechurch, Bromsgrove
Neville, John, jun....Alvechurch, Redditch
Noel, Captain C. P....Bell Hall, Stourbridge
†Nott, James...Penn Hall, Eardiston, Tenbury
Padmore, Richard...Worcester
Parker, Rev. W ...Little Comberton, Pershore
†Philips, Sir G.R., Bt ..Weston Ho , Shipston-on-Stour
Phipps, Thomas...Bricklehampton, Pershore
Pippett, William...Caughton House, Redditch
Prance, Courtnay C ...The Elms, Evesham
Prescott, Mrs....Birches Farm, Tenbury
Randell, Charles...Chadbury, Evesham
Randell, James R....Chadbury, Evesham
Rich, S... Cedars, Fearmale Heath Worcester
Roberts, A J....Bretforton, Evesham
Robins, W. S .. Dunsley Hall, Stourbridge
Rudge, E. C....Abbey Manor, Evesham
†Sheldon, H. J....Brailes House, Shipston-on-Stour
Sherriff, A. C , M.P....Worcester
Smith, Henry William...Evesham
Smith, Ralph...Lenchwick, Evesham
Smith, R Vassar...Ashfield, Great Malvern
Smith, William...Offenham, Evesham
Smithin, Benjamin...Dumbleton, Evesham
†Southall, Thomas...Worcester
†Stallard, John ..Worcester
Stallard, Josiah...The Blanquettes, Worcester
Stamford and Warrington, Earl of...Enville House, Stourbridge
Stephens, George...Fladbury, Pershore
Trinder, T....Cradley, Malvern
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Walker, G. I. Alexander...Norton, Worcester
Wall, Thomas...The Ford Farm, Droitwich
†Walton, H. L....Barmington, Shipston-on-Stour
Warmington, C....Granville Hall, Kinton, Evesham
†Watkins, J. G....Woodfield, Ombersley, Worcester
†Watson, John...Waresley, Kidderminster
Webb, Edward, jun....Wordsley, Stourbridge
Webb, Frederick Pace...Evesham
Webb, Henry...14, Foregate Street, Worcester
Webb, William...Worcester
†Wheeler, E. V....Kyrewood House, Tenbury
Whitford, Richard...Avon Side, Evesham
†Wilson, John Wilson...Broadway, Evesham
Woodward, R....Ardley Castle, Bewdley
†Wyley, James...Corley Villa, Malvern Link

YORKSHIRE.

Governors

†Aldham, William. .Frickley Hall, Doncaster
†Cathcart, Earl...Thornton-le-Street, Thirsk
†Childers, John W... Cantley Hall, Doncaster
†Dent, John D ...Ribston Hall, Wetherby
Feversham, Earl of. .Duncombe Park, Helmsley
Fitzwilliam, Earl, K G ...Wentworth, Rotherham
†Harewood, Earl of...Harewood House, Leeds
Johnstone, Sir H , Bt , M.P .Hackness Hall, Scarboro'
Ripon, Marquis of...Studley Royal, Ripon
Stourton, Lord...Stourton, Knaresborough
Willoughby, Hon. Digby...Settrington House

Members.

†Akroyd, Edward...Bank Field, Halifax
Angas, George...Beeford Grange, Lowthorpe, Hull
†Ashton, R. H ...Castletown, Sheffield
†Atchison, William...Bowling Works, Bradford
†Athorpe, J. C....Dinnington Hall, Rotherham
†Auckland, Lord...Doncaster
Bamlett, A C.... Thirsk
†Barber, Thomas...Sproatley Rise, Hull
†Barker, Edward...Pickburn, Doncaster
†Barstow, C D ...Garrow Hill, York
†Barton, J. Hope...Stapleton Park, Pontefract
Bartram, William...Harrogate
Baxter, Benjamin...Elslack Hall, Skipton
Baxter, Robert...Doncaster
Beachel, John...Rawcliffe, Selby
Beckitt, Richard...Watton Abbey, Driffield
Best, Captain Robert Storr. .Moorfields, Goole
Bethell, William...Rise, Beverley
†Bolton, Lord...Bolton Hall, Bedale
Booth, John B ...Killerby, Catterick
Booth, Thomas C....Warlaby, Northallerton
Borton, John...Barton-le Street, Malton
Botterill, Richard...Wauldby, Brough
Botterill, John...Eppleworth, Cottingham, Hull
Bower, E C ...Wadworth Hall, Doncaster
Bower, R. H....Welham Hall, Malton
†Boynton, T....Ulrome Cottage, Lowthorpe, Hull
†Briggs, Rawdon ..Birstwith Hall, Ripley
Broadley, W. H. H., M P....Welton Hall, Brough
†Brogden, Robert...Great Ouseburn, York
†Bromet, William R ...Cocksford, Tadcaster
Bromley, Robert...Airmyn, Howden
†Brooke, William...Northgate House, Huddersfield
†Broomhead, B P....Broomhall Park, Sheffield
Brown, E....Bilborough Lodge, York
†Brown, Douglas...Ancliffe Hall, Northallerton
Brown, William...Holme-on-Spalding Moor, York
Bushell, Henry.. Skeldergate, York

Butterworth, George...Airmyn, Howden
†Cadle, Miles...Coatham, Redcar
Campbell, H....Owston Grange, Rotherham
Carlin, William...Keyingham, Hull
Cathcart, Col. the Hon. A....Spennithorne, Bedale
Cattle, James...Warter Wold, Pocklington, York
Cayley, Edward S....Wydale, York
Cayley, Sir Digby, Bart....Brompton, York
Chaloner, Admiral...Longhull, Guisborough
†Chambers, B. E. C....High Green House, Sheffield
†Champion, F. C....The Refuge, Burton, Ganton
Champneys, Rev. T. P....Badsworth, Pontefract
Charlesworth, C. E....Wooley Moor House, Wakefield
†Charlesworth, John...Middlestown, Wakefield
†Charlesworth, J. Barff...Hatfield Hall, Wakefield
†Charlesworth, Joseph...Lofthouse
Charlton, Thomas...Newlands, Middlesborough
†Cholmley, H. W....Newton Hall, Rillington
†Clarke, Frederick J. P....North Ferriby, Hull
Clarke, John W....Guisborough
†Clay, Charles...Walton Grange, Wakefield
Clayton, T. Greenwood...Ousecliff, York
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†Clutton, William James...The Mount, York
†Cocking, W. F....Crowle, Doncaster
Coleman, John...Eserick Park, York
Collison, William...Beverley
†Comber, Thomas...Redcliffe, Newton-le-Willows
Cook, Edward J....Kingston-upon-Hull
†Cooke, Philip B. D....Owston Hall, Doncaster
Corner, Edward...Esk Hall, Whitby
Coulman, Edward...Plains House, Thorne
Coulman, John ..Red House, Thorne
Cox, J. S....Whiston Hall, Rotherham
†Crathorne, James S....Skidby, Hull
†Creyke, Ralph...Rawcliffe Hall, Selby
†Croft, A. H....Aldborough Hall, Boroughbridge
Crosskill, Alfred. .Beverley
†Crowther, J. F....Knowle Grove, Mirfield
Crust, Joseph...Catwick, Skirlaugh, Hull
Cundy, T. Tyson...Hall Orchards, Wetherby
Cuthbert, Robert...Patrick Burmpton, Bedale
Dalton, John...Sleningford Park, Ripon
Danby, F....Middledale, Kirbygrindalyth, York
Darley, Charles A....Burtonfield, York
Darley, Henry...Aldby Park, York
Darrell, Thomas...Spickers Hall, West Ayton, York
†Darwin, Francis...Creskeld Hall, Otley
Davison, Richard...Driffield
Dawson, George...Thorncliffe, Sheffield
Deane, Patrick ..High Street, Hull
†Dickinson, William...Riccall Hall, York.
Dudding, Thomas...Fockerby, Goole
Dunn, Jonathan...Kelfield Lodge, York
Dunn, R. L....Hatfield Parva, Skirlaugh
Durham, Makin...Thorne
Dyke, Francis Hart...3, Museum Street, York
†Eddison, R. W....Headingley Hill, Leeds
†Eddison, William...Huddersfield
Edwards, Sir H., Bart....Pye Nest, Halifax
Elston, William...Bank House, Selby
†Fairbairn, Sir A....Goldsborough Hall, Knaresborough
Fairley, Thomas...16, East Parade, Leeds
†Farrer, H. R....Green Hammerton
Farrer, J....Ingleborough (Lancaster)
†Fawkes, Ayscough...Farnley Hall, Otley
Fisher, Edward...Grove Hill, Beverley
Fisher, John...Carhead, Crosshills, Leeds
Fisher, Robert, jun....Leconfield, Beverley
Fisken, T. R. H ...Seven Arch Works, Leeds
Forbes, Arthur E. W ...Wentworth Woodhouse Rotherham
Ford, John...Tancred, Whixley, York
Foster, John...Fockerby, Goole
†Fox, G. Lane...Bramham Park, Tadcaster
Francis, G. C....Saltaugh Grange, Keyingham, Hull
†Francis, G. L....Saltaugh Grange, Keyingham, Hull
†Frank, F. Bacon...Campsall Hall, Doncaster
Freeman, Joseph...Keyingham
Garbutt, Thomas...Yarm, Cleveland
Garnett, J....Rawdon Hill, Harewood, Leeds
Gartside, Henry...Wharmton Tower, Greenfield, Saddleworth
Gascoyne, F. C. T....Padlington, South Milford
Gauntlett, W. Henry...Middlesboro'-on-Tees
Gilpin-Brown, George...Sodbury Park, Richmond
Glew, James...Prickett Hill, Howden
Godfrey, H. W. G....Bank House, Thorne
Gothorp, James...Mowbray Hill, Bedale
Gouthwaite, Richard...Lumby, South Milford
Green, Robert.. Scalby, Scarborough
Greenwood, F. B....Swarcliffe Hall, Ripley
†Greig, David...Leeds
†Gunter, Colonel R....Wetherby
†Halifax, Viscount...Hickleton Hall, Doncaster
†Hall, Charles E....22, Grove Terrace, Leeds
Hall, James...Scarboro' Hall, Beverley
Handley, Frederick...St. Mary's, York
†Hardacre, Richard...Hellifield, Leeds
†Harland, H. Seaton...Brompton, York
Hathorn, A....Smeathalls, Ferrybridge
†Haworth-Booth, Lieut.-Colonel...Derwent Park, Malton
Hebblethwaite, Thomas F....Hull
Hepworth, Joshua...Rogerthorp, Pontefract
†Herries, Lord...Everingham Park, Pocklington
Hewson, Frederick...The Haven Farm, Tickhill
†Hildyard, J. G. B. Thoroton..Winestead Hall, Hull
†Hildyard, J. R. W.....Hutton Bonville Hall, Northallerton
†Hincks, Captain T. C....Breckenborough, Thirsk
Holroyd-Bradbury, G. E....Longroyde, Rastrick
Hornby, Thomas...West Flotmanby, Ganton
†Hotham, Lord...Dalton Hall, Hull
Hunt, Wm....Lorne Villa, Eldon Grove, Hull
†Hutchence, William A ...Northallerton
Hutchinson, T. H....Manor House, Catterick
Hutchinson, William...Gunby, Selby
†Hutton, John...Solberge, Northallerton
Ingham, T. H ...Skipton
Ingham, John...Mair, Doncaster
Ingilby, Sir H. D., Bart....Ripley Castle, Ripley
‡Jaques, Leonard...Wentbridge House, Pontefract
Jaques, R. M....Easby Abbey, Richmond
Jaques, T. G....Blacktoft, Howden
Jefferson, Rev. J. D....Thicket Priory, York

†Jefferson, Jos. J. Dunnington..Thicket Priory, York
Johnson, Botterill...Frodingham Bridge, Hull
†Johnstone, J. C. Hirst..The Grange, Seacroft, Leeds
Jordan, J. Staveley...North Dalton, Hull
†Kaye, J. E....Bretton Park, Wakefield
Kearsley, George...Prospect House, Ripon
†Kirk, Richard...Gale Bank, Wensleydale
Kitson, James...Leeds
†Knowles, James...Middlestown Farm, Wakefield
†Lambert, C ...Sunk Island, Otteringham, Hull
Lancaster, George...Moreton Grange, Northallerton
Langdale, G. W....Leconfield Park House, Beverley
†Lascelles, Hon. G. E....Sion Hill, Thirsk
Laverack, S. S....Redness Hall, Goole
†Lawley, Hon. and Rev. S. W..Escrick Rectory, York
Laycock, W....Woodville, Keighley
Leatham, Gerald A. B....Thorganby Hall, York
Leatham, W. H....Hemsworth Hall, Pontefract
Leather, J. T....Leventhorpe Hall, Leeds
Lee, Charles...Newton House, Bedale
Lee, Thomas M....Field House, Hunmanby, York
Legard, Sir C., Bart....Ganton Hall, York
Linton, William...Sheriff Hutton, York
Linton, William...Sheriff Hutton, York
Lister, George...Cottingham, Hull
†Londesborough, Lord...Grimston, Tadcaster
Lowe, Robert...Shire Green, Sheffield
†Lupton, Arthur...Headingley, Leeds
Macfarlan, Walter...Chapel Thorpe, Wakefield
Mangles, George...Givendale Grange, Ripon
Markham, Lt.-Col. W. T..Becca Hall, Milford Junction
†Marshall, Arthur...Headingley, Leeds
†Marshall, J. Garth...Headingley, Leeds
Marshall, James W....Blanch Farm, Pocklington
Matthews, Francis Cooke...Driffield
Mellows, William...High Melton, Doncaster
†Meysey-Thompson, Sir H. M., Bart....Kirby Hall, York
Milbank, Powlett C....Thorpe Perrow, Bedale
Mills, R. W. F....Lendal, York
Moore, W. C....Bamford, Sheffield
†Moorsom, C. R....Harewood, Leeds
†Morrison, Walter...Malham Tarn, Skipton
Morrison, William H....Wood Hall, Barnsley
Moscrop, W. J....Olliver, Richmond
Nicholson, Brady...Stourton Grange, Garforth, Leeds
Nicholson, Thomas....100, Lowther Street, York
Norfolk, Richard...Beverley
†Normanby, Marquis of...Mulgrave Castle, Whitby
Nowell, W. Atkinson....Linton House, Skipton
†Orde-Powlett, Hon. W. T....Wensley Hall, Bedale
Outhwaite, John...Bainesse, Catterick
Owen, William...Rotherham
Pardey, James E....Newton-le-Willows
Parker, Banastre...Riccall Hall, York
Parker, T. J....North Church Street, Sheffield
†Parr, W. F....3, Stonegate, York
†Parsons, Edward...Birdsall, York
†Paver, William...Peckfield, Milford Junction
†Paver-Crow, R....Ornham Hall, Boroughbridge
†Phillips, J. H....22, Albemarle Crescent, Scarboro'
†Pilkington, Sir L. M. S., Bart...Chevet Pk., Wakefield
†Powell, Rev. S. H....Sharon Hall, Ripon
†Preston, Captain J. N....Flasby Hall, Gargrave-in-Craven
Preston, T....Scosthrop House, Bell Busk, Leeds
Preston, Thomas H. ..Moreby Hall, York
Pugh, W. B....Patrington, Hull
†Pulleine, James...Clifton Castle, Bedale
†Ramsden, Sir J. W., Bart....Byram, Ferrybridge
Richardson, G ...Bridlington Quay
Richardson, H....Cherry Hill, York
†Richardson, R....Skirlaugh, Hull
†Riley, Edmond...Kipling Cotes Farm, Hull
†Ringrose, R. B....Swanland, Brough
Robinson, James...Hook, Howden
Robinson, T....Nuthill, Hedon, Hull
†Rockett, John H....Goole
Rollett, Richard...Thorne
Rounding, Thomas...Fraisthorpe, Bridlington
†St. Leger, Colonel...Park Hill, Rotherham
Salt, Sir Titus, Bart....Crow Nest, Halifax
Saltmarshe, Philip...Saltmarshe, Howden
Sanday, G. H....Wensley House, Bedale
Satterthwaite, T. E. S....Castle Howard
Sawney, William...Beverley
Shann, Charles...Inholes, Tadcaster
Sharp, Isaac...Middlesborough-on-Tees
Singleton, J. R....Great Givendale, Pocklington
Slingsby, Thomas...Scriven Park, Knaresborough
†Smith, Henry F....Lamwath House, Sutton, Hull
†Smith, J. Metcalf...Leeds
Smith, Jacob...Humberton, Helperby
Smith, Robert...Ardwick-le-Street, Malton
Smith, William...Goole Grange, Goole
Smurthwaite, Thomas...Bootham Terrace, York
Snowden, John D ...Doncaster
Sorby, Horatio...Aughton, Rotherham
Stamper, T....Highfield House, Oswaldkirk, York
†Stanhope, W. T. W. Spencer, M.P....Cannon Hall, Barnsley
†Stapylton, Major...Myton Hall, Boroughbridge
Staveley, John...Southburn, Driffield
Staveley, Simpson...Tibthorpe Manor, Driffield
Stevenson, Peter...Rainton, Thirsk
†Stickney, Walter M....Hull
Stickney, William...Holly Bank, Ripley
Stott, Miss...Pool House, Otley
†Stourton, Henry...Holme Hall, York
†Strickland, C. W....Hildenley, Malton
Suffield, Thomas...Tanfield House, Bedale
†Swann, Robert...Askham Hall, York
†Sykes, C., M.P....Brantingham Thorpe, Brough
Taylor, F. Howard...Middlewood Hall, Barnsley
†Taylor, G. E....Langthorpe House, Boroughbridge
Tempest, Colonel...Tong Hall, Leeds
†Tennant, Robert...Scarcroft Lodge, Leeds
Tennant, Thomas...Blenheim Terrace, Leeds
†Thompson, Joseph...Anlaby, Hull
Thompson, Leonard...Sheriff Hutton Park, York
†Thornes, Joseph...Green House, Ossett, Wakefield
†Tiffen, Joseph...Minster Corner, Beverley
Tinker, Henry...Holmfirth, York
Topham, Wm....Kirkburn Manor, Driffield
Toulson, John Parker...Skipworth Hall, Selby
Townend, Edward...The Nook, Bingley, York

Tweedie, R ...The Forest, Catterick
Tyson, I. O....Ousegate Works, Selby
†Vyner, H F. Clare...Newby Hall, Ripon
Waistell, William...Northallerton
†Walker, F. James...Claxton Grange, York
Walker, James R....Sandhutton, York
Walker, Joseph...The Poplars, Knaresborough
Walker, Thomas...The Woodlands, Doncaster
Walker, Thomas S....Maunby Hall, Thirsk
Walker, William...Victoria Works, York
Walmsley, G....Rudston House, Bridlington
Waterhouse, Samuel, M.P....Halifax
Watson, T....Holderness Hotel, Beverley
†Welby, E. M. Earle...Norton Leas, Sheffield
†Wenlock, Lord...Escrick Park, York
Wentworth, Godfrey H....Woolley Park, Wakefield
Wharton, G. Livingstone...Grove Hill, Beverley
Wharton, Rev. J. C....Gilling Vicarage, Richmond
†Wharton, J. T....Skelton Castle, Guisborough
Wheatley, John...Neswick, Driffield
Whitaker, B. Ingham...Hesley Hall, Rotherham
White, John...Morthen, Rotherham
Whitehead, George...Deighton Grove, York
Wickham, L. W....Chestnut Grove, Tadcaster
†Williamson, W. E....Catterick
Willis, Thomas...Manor House, Carperby, Bedale
Wilmot, R. C....Woolley Park Farm, Wakefield
†Wilson, John...Seacroft Hall, Leeds
Wilson, Matthew...Eshton Hall, Gargrave, Leeds
Wilson, M. W....Eshton Hall, Gargrave
Winter, Richard...The Levels, Thorne
†Wombwell, Sir G. Bart....Newburgh, Easingwold
Wood, Richard...Potternewton, Leeds
Woodd, Basil T., M.P....Conyngham Hall, Knaresborough
†Woodyear, Rev. J. F. W....Crookhill, Doncaster
Worsley, Major W. Cayley...Hovingham, York
Wray, John...Leeming Bar, Bedale
†Wright, George...North Anston, Rotherham
Wright, Sir William...Sigglesthorne, Holderness
†Wrightson, R. H....Warmsworth Hall, Doncaster
†Wrightson, W. B....Cusworth Park, Doncaster
†Wyse, Robert...Auburn Hill, Malton
†Yeoman, G. Dundas...Woodlands, Whitby
†Yeoman, R C...Marsk Hall, Marsk-by-the-Sea
Yorke, E. C....Hutton Hall, York
†Yorke, John...Beverley Hall, Pateley Bridge
†Yorke, T. E...Halton Place, Hellifield, Leeds
Yorkshire Agricultural Society, Secretary of
†Zetland, Earl of...Aske Hall, Richmond

CHANNEL ISLANDS.

Governor.

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Boyd-Kinnear, John...Courtil, Rozel, Guernsey
Collings, Rev. W. T....Guernsey
James, J....Les Vauxbelets, Guernsey
Jones, Wm. M....St. Peter's Port, Guernsey
Le Cornu, C. P....La Hague Manor, Jersey
Le Gallais, Albert...La Moire House, Jersey
Lempriere, Rev. W....Rozel Manor, Jersey
Le Page, T. B....St Andrews, Guernsey
†Turner, Lieut.-Colonel F. H ...Gouray, Jersey
Watson, Rev. Joshua R....Le Bocage, Guernsey

NORTH WALES.

Governors.

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†Powis, Earl of...Powis Castle, Welshpool
Wynn, Sir W. W. Bt., M.P....Wynnstay, Ruabon

Members.

Adams, Captain A. F....Rhyddyn Hall, Wrexham
†Bankes, J. Scott...Soughton Hall, Northop
†Barnes, J. R....Brookside, Chirk
†Barnes, Thomas...The Quinta, Chirk
Bate, Edward...Kelsterton, Flint
Bell, William...Bodrhyddan, Rhuddlan, Rhyl
†Best, Captain J. C....Plas-yn-Vivod, Llangollen
Biddulph, R. Middleton...Chirk Castle
Blezard, Robert...Pool Park, Ruthin
†Bowman, J. B....Sandycroft Farm, Hawarden
Buddicom, W. B....Penbedu Hall, Mold
†Burton, John...Gresford, Wrexham
†Burton, Owen...Gwaynynog, Denbigh
Chambres, P. H....Llysmeirchion, Trefnant, Rhyl
Chapman, Richard H....St. Asaph
†Charlton, St. John...Pentreffynon, Holywell
Cooke, Lt.-Col B G. D....Colomendy, Mold
Cotton, F. E....Knowlton Hall, Ruabon
Crewe-Read, Capt., R.N....Llandinam Hall, Montgomery
Darbishire, S. D....Pendyffryn, Conway
†Darby, Abraham...Treberfydd, Brecon
Davies, James...Jamesford, Montgomery
Dawson, John...Gronant, Rhyl
Dennis, Henry...Hafod-y-bwch, Ruabon
Denson, Samuel...Pwllhalog Hall, Rhyl
Dickin, John...Tyndwfr, Llangollen
†Dod, Whitehall...Llannerch, St. Asaph
†Doyle, John A ...Plâs Dulas, Abergele
†Elwell, E....Nenaddfraith, Newtown
Evans, John...Abernant, Llanwrtyd, Brecon
Eyton, John Wynne...Lees Wood, Mold
Farmer, George...Montgomery
Farmer, James U....Llyssum, Welshpool
†Fitzhugh, Thomas Lloyd...Plâs Power, Wrexham
†Fortune, W....Newtown, Montgomery
†Gillart, Richard...Llynllvedd, Machynlleth
Goodwin, Robert...Newtown
†Green, Edward...The Moors, Welshpool
Griffith, William...Glyn, Dolgelly
Hare, T. W....Berthddu, Llandinam
†Hellyer, G. W. M ...Tan-y-Garth, Bettws-y-coed, Llanrwst
Hayward, Major...Crosswood, Welshpool
Hill-Trevor, Lord A. E., M.P....Brynkinalt, Chirk
Hodgson, L Scott...Sodylt Hall, Ruabon

Hope, S. Pierce...Marchwiel Hall, Wrexham
†Howard, Robert...Broughton Hall, Wrexham
†Hughes, H. R....Kinmel Park, St. Asaph
Hughes, H. R....Ystrad, Denbigh
†Humberston, P. S....Glan-y-Wern, Denbigh
†Humphreys, Arthur C ...Garthmyl
Jesse, John F....Llanbedr Hall, Ruthin
Jones, Lt-Col. A. S., V.C...Hafod-y-Wern, Wrexham
Jones, Edward...Park Farm, Caersws
Jones, Thomas...Summerfield Park, Llanidloes
Jones, William...Blackhall, Newtown
Kenyon, C. R....Brynllneydwyn, Machynlleth
Kerfoot, James...Hendre Back, Abergele
Kerfoot, John...Faenol Back, St. Asaph
Kinsey, Roger...Berthddu, Llandinam
Kirkby, D. E....Llanfendigaid, Towyn
Kyrke, R. V....Nantyffrith Hall, Wrexham
†Lewis, George...Worthenbury, Wrexham
Lloyd, Joseph...St. Asaph
†Lloyd, Llewellyn...Croesnewydd, Wrexham
Lloyd, Richard, jun....Broad Street, Newtown
Mainwaring, Charles S....Galltfaenan, Rhyl
†Mainwaring, Townshend...Galltfaenan, Denbigh
Meridith, John...Puckley, Montgomery
Meyrick, Owen Fuller...Bodergau, Anglesey
Miller, Samuel...The Court, Abermule
Moore, John...Glananmihely, Newtown
Morgan, Richard...Newtown
†Morris, Thomas...Henfaes, Welshpool
Mostyn, Sir Pyers, Bart....Talacre, Holywell
†Mytton, D. Herbert...Garth, Welshpool
†Naylor, John...Leighton Hall, Welshpool
Newell, Evan...Escuan Hall, Towyn
Owen, Griffith H....Ymlch, Carn Dolbenman, R.S O.
Owen, William...Hendre Vaux, Abergele
†Palmer, Sir Roger W., Bart...Cefn Park, Wrexham
Parmeter, Francis, Jun ...Brynyraber, Bala
Parry, William...Towyn
Peel, Edmund...Bryn-y-Pys, Wrexham
Peers, Joseph...Ruthin
†Pennant, P. Pennant...Brynbella, St Asaph
†Philips, Captain E. W....Rhual, Mold
Pickering, William...Poulton, Pulford, Wrexham
Podmore, Robert...Sealand, Queen's Ferry, Flint
Powell, Evan...Swanside, Newtown
†Price, R. J. Lloyd...Rhiwlas, Bala
Prichard, T....Llwydiarth, Esgob, Llanerchymedd
Pryce, Thomas...Scafell, Newtown
Pryce, Edward...The Henfron, Montgomery
†Pryce, John...Ty-Maur, Penstrowed, Newtown
Pughe, William...Bryntlys, Llanbrynmair
Roberts, B. S....Burton Hall, Wrexham
Roberts, F. L ...Queen's Ferry, Flint
Roberts, Rev. John...Fron, Carnarvon
Roddick, Thomas...Penbedu Uchof, Mold
Rowland, W....Royal Oak Hotel, Welshpool
Ruck, Lawrence...Pantlludw, Machynlleth
†Sandbach, H. R....Hafodunos, Abergele
†Sisson, Robert J....Talardy, St. Asaph
Smith, R. Barclay...Tynewydd, Bangor
Sutton, Ambrose...Althrey, Wrexham
Sykes, John...Croes Howell, Wrexham
Thomas, L H....Caerffynnon, Talsarnau, Caernarvon
Trethewy, A. H....Rhyd-y-crena, Llanrwst
Turner, William...Newtown
Vaughan, J. W....Velin Newydd House, Brecon
†Verney, Comm., R.N....Rhianva, Menai Bridge
†Willett, Richard...Lower Leighton, Welshpool
Williams, David...Dinas, Tyn-y-gougle, Anglesey
Williams, Sir Hugh, Bart...Bodelwyddan, St. Asaph
†Williams, John...Gwernhefin, Bala
Williams, Owen John...Bodelwyddan, St Asaph
†Williams, R. Ap Hugh.. Bodelwyddan, St. Asaph
†Williams, Wm....Plasgwyn, Pentraeth, Anglesey
†Williams, W. Granville...Bodelwyddan, St. Asaph
Wood, E. B....Moreton Hall, Chirk
Woosnam, Richard...Glandwr, Llanidloes
Wynne, Brownlow W....Garthewin, Abergele
Wynne, John Lloyd...Coed Coch, Abergele
Wynne, Owen Slaney...Ruabon
Wynne, William W. E ...Peniarth, Towyn

SOUTH WALES.

Governor

Cawdor, Earl of...Stackpole Court, Pembrokeshire

Members.

Allen, Henry G....Lawrenny Park, Pembroke
Allen, R....Ty-to-Maen, St. Mellons, Cardiff
Arabin, W. St. Julien...Preswylfa, Neath
†Bailey, Sir J.R., Bt., M.P...Glanusk Pk., Crickhowell
†Baird, Alexander...Robeston Hall, Milford Haven
Ball, James...Peterstone Mills, Cardiff
†Boardman, Frederick B ...Manoravon, Llandilo
Bowen, James B....Llwyngwair, Haverfordwest
Bradley, Edward...Cowbridge
Bridgwater, Rees W....Great Porthamel, Talgarth
Buckley, James...Penyfai House, Llanelly
†Budd, J. Palmer...Ystalyfera, Swansea
Carver, Richard R...Wenallt, St. Clears
Clark, George T....Dowlais House, Merthyr Tydvil
Corbett, John Stuart...Cogan Pill, Cardiff
David, Charles W....Ely Rise, Cardiff
†David, Edward...Llandaff
Davies, D. Price...Troedybryn, Llandilo
Davies, John Morgan...Froodvale, Llandilo
Davies, L. T....Llyncubing, Llanpumpsaint
Davies, Thomas...Parkypratt, Cardigan
Davies, Thomas...Ystradwalter, Llandovery
Davys, R. Campbell...Nanaddiawe, Llandovery
Davys, W. H. C....Neuadd-fawr, Llandovery
Dunn, Nicholas J ...Elm Grove, St. Florence, Tenby
Dynevor, Lord...Dynevor Castle, Llandilo
Ellis, Philip P....Herbrandstone Hall, Milford Haven
Emlyn, Viscount...Golden Grove, Carmarthen
Evans, Lieut.-Col. H. D...Highmead, Llanybyther, Cardigan
†Evans, Henry J....Bank, Cardiff
Evans, James Eaton...Milford Haven
Evans, J. Jones...Cwmbychan Farm, Pencader
Evans, William...Fron, Llandovery, Carmarthen
Fisher, George...Bute Villa, Cardiff
Fitzwilliams, E. C. L....Adpar, Newcastle Emlyn
†Franklin, Richard...Clemenstone, Bridgend

Garsed, John   Llantwit Major, Cowbridge
†Gower, Erasmus...Clynderwen, Narberth
†Gower, R. Frederick...Clynderwen, Narberth
Green, Stephen...Haverfordwest
Griffith, C. M....Llwynduris, Llandyssil
Griffith, John...Trevorgan, Cardigan
Gulston, A. J ...Dirleton, Llangadock
Gwyn, Howel...Dyffryn, Neath
Harvey, R. Hart...Slade House, Haverfordwest
Homfray, J R....Penllyn Castle, Cowbridge
Howell, J. R....Noyadd Trefawr, Llandyssil
†Hulme, William ..The Bank, Pembroke
Huntley, W. V....Welsh St Donatts, Cowbridge
Insole, J. H....Ely Court, Llandaff
James, John...Aberclyn, Brecon
James, Richard.. High Street, Haverfordwest
Jenkins, R. D....The Priory, Cardigan
Jenkins, Thomas ..Pantyscallog, Dowlais
Jenner, B. St. Albyn...Bryn-tirion, Bridgend
Jennings, Richard...Carmarthen
†Jones, David...Pantglas Carmarthen
†Jones, John ..Blaenos, Llandovery
Jones, John...Coedlananfawr, Llanybyther
Jones, Thomas...Talardd, Pencader, R S O
Jones, William...Cefn Llogell, Castletown, Cardiff
Jones, William...Llwynygroes, Lampeter
Jones, William...Pantrewgoch, Castletown, Cardiff
Leach, Henry...Corston, Pembroke
Lewes, Colonel John...Llanllar, Talsarn
Lewis, John Lennox G. P ...Henllan, Narberth
Lewis, W. H ...Clynfiew, Newcastle Emlyn
†Leyson, William...Penyscynwor, Neath
Little, William ..Cwmaman, Aberdare
†Llewellin, Richard...Tregwynt, New Quay
Longcroft, Charles R ...Llanina, Aberayron
†Mansell, Sir John, Bart   Maesdilo, Llandilo
Marsh, R... Pen-y-bedd, Burry Port, Carmarthen
Moir, Charles...Cardiff
†Morgan, Colonel the Hon. F. C, M P, .Ruperra Castle, Newport
Morris, Edwyn John...Gwernaffell, Knighton, Radnorshire.
Morris, William...Carmarthen
Mousley, T. Turner...Stackpole Court, Pembroke
†Nicholl, G W....Llantwit Major, Cowbridge
†North, George F ...Brecon
Norton, Henry...Greenhill, Carmarthen
†Owen, Daniel...Ash Hall, Cowbridge
Owen, William ..Withybush, Haverfordwest
Palling, J G   Castletown, Cardiff
Paramore, J Rawle.. Preswylfa, Neath
Peel, William...Taliaris Park, Llandilo
Peel, Jonathan...Aberystwith
Penrice, Thomas...Kilvrough, Swansea
Powell, D. Jeffreys ..The Court, Bronllys, Talgarth
†Powell, W. S ...Eglwysnunyd, Taibach
Preece, Thomas...West House, Wick, Bridgend
Price, Alfred B ...The West, Bridgend
Prichard, W....Bryn-tirion, Bridgend
Pryse, John Pugh...Bwlchbychan, Llanybyther
†Pugh, David...Manoravon, Llandilo
†Reece, Edward B .Roath, Cardiff
Reece, R Lewis ..Cardiff
Rees, G Arthur.. Divlyn, Llandovery
Rees, John...Hendre, St. Dogmells, Cardigan
Rees, John...Tile House, Lanmaes, Cowbridge
Rees, Valentine...Carmarthen
Rees, William...Penywaun, Lanvabon, Pontypridd
Roberts, W. B ..Lovestone, Pembroke
†Rosser, William ...Llanelly, Carmarthen
Scott, William, C E ...Northgate Street, Aberystwith
†Severn, J. Percy...Penybont Hall, Penybont
†Sheild, William H....Lampeter Valley, Narberth
Simpson, John ..Pyle Hotel, Bridgend
Smith, J. J ...Jeffreston Farm, Tenby
Spencer, Michael.. West Aberthaw, Cowbridge
†Stacey, F E ...Llandough Castle, Cowbridge
†Stewart, W. M ...Hafodneddyn, Llandilo
Strickland, G . Tretower House, Crickhowell
Talbot, C R Mansell...Margam
Talbot, Gerald H . .Manobere
Thomas, D. Howell ..Derllys Court, Carmarthen
Thomas, John...Glanrynis, Kidwelly
Thomas, Captain John...Eastfield House, Cowbridge
Thomas, J Howell...Starling Park, Carmarthen
Thomas, Thomas...St Hilary, Cowbridge
Traherne, G M....St. Hilary, Cowbridge
†Turbervill, Major...Ewenny Priory, Bridgend
Vaughan, Captain Herbert...Brynog, Talsarn
†Vaughan, Nash V E....Rhesta, Neath
Vivian, H. Hussey, M P ...Park Wern, Swansea
Waldron, Clement...Cardiff
†Walters, William...Haverfordwest
Waring, Thomas...Park Place, Cardiff
Watt, J. W Gibson.. Doldolowe, Radnorshire
Whittall, T....Bailey Inon, Llandrindod Wells
Wienholt, F....Langharne
Williames, Charles H....Roath Court, Cardiff
Williams, Christopher...Glyn Teg, Ely, Cardiff
Williams, Captain G. G ...Wallog, Aberystwith
Williams, John...Caercady House, Cowbridge
Williams, Rees ..Pencelly Castle, Brecon
Williams, Rees David ..Mannest Court, Brecon
Williams, R. Wyndham...Windsor Villa, Cardiff
Williams, W. Propert...Trehowell, Fishguard
Workman, Henry ..Coedkernew, Cardiff
Wright, W Thwaites...St. Nicholas, Cardiff
Yorath, Evan. Moulton Farm, Cowbridge
Yorath, Henry ..13, St John Street, Cardiff

IRELAND.

Members

Abercorn, Duke of, K.G ...Baron's Court, Newtown Stewart, Tyrone
Allen, George. .Unicarville, Comber, Co Down
Anderson, T ..Levitstown, Mageney, Co Kildare
Bagot, Rev R Wolfe...Fontstown, Athy, Kildare
Baldwin, Thomas...Glasnevin, Dublin
Bessborough, Earl of ..Pilltown
†Blacker, M M ...Claremont, Claremorris, Mayo
Borthwick, John...Prospect, Carrickfergus
†Browne, Lord John T....Westport, Co Mayo
†Bulwer, Walter Redford..Randalstown, Co Antrim

Callan, P....Dowdstown, Ardee, Co. Louth
Campbell, Arthur J... St. James's Place, Fermoy
Carroll, W. Hutchinson...Tulla House, Nenagh
Castletown, Lord...Granstown Manor, Ballycola, Abbeyleix
†Caulfield, St. George...Donamor Castle, Roscommon
†Charlemont, Earl of...Charlemont House, Dublin
†Clarina, Lord...Elm Park, Limerick
†Clonbrock, Lord...Clonbrock, Ahaserah
†Collis, S. Edward...Tarbert, Co. Kerry
Cooper, E. H....Markree Castle, Colloney, Sligo
†Cosby, R. G....Stradbally Hall, Queen's County
Crawford, W. H....Lakelands, Cork
Crosbie, William T....Ardfert Abbey, Tralee
Digby, Reginald...Geashill Castle, Tullamore
†Doneraile, Viscount...Doneraile Court, Co. Cork
Downing, John...Ashfield, Fermoy
Enniskillen, Earl of...Florence Court, Enniskillen
†Farrell, E. W....3, Merrion Square East, Dublin
Farrell, John Arthur...Moynalty, Co. Meath
Featherstonhaugh, R....Rockview, Killucan
†Filgate, L. G. P....Lisvenney, Ardee
Forster, A. T....Garrettstown, Kinsale
Garde, Thomas..Ballinacurra, Middleton, Co. Cork
Garfit, Charles...Queenstown, Co. Cork
Gould, Theobald B....Spy Hill Cottage, Queen town
Goulding, William...108, Patrick Street, Cork
Greene, John...Millbrook, Magany
Hall-Dare, R. Westley...Newtownbarry House
Hamilton, C. W....Hamwood, Clones
†Harman, Hon. L. King...Rockingham, Boyle
†Hawkesworth, Richard S....Forest Mountrath
Holmes, W....Clovervale, Island Magee
Hope, T. R....Dunstafnage, Stillorgan, Co. Dublin
†Jones, W. Bence...Lisselan, Clonakilty
†Keane, R. F...Dernhun, Cappoquin, Co. Waterford
Knox, O. N....Corgrig Lodge, Foynes
Leigh, Francis A....Rosegarland, Foulksmill
†Longfield, R. E....Longueville, Mallow
†Longford, Earl of...Packenham Hall, Westmeath
Low, George...Burghtown, Athy, Kildare
Lurgan, Lord...Brownlow House, Lurgan
Mackenzie, James...Camden Quay, Cork
Mackenzie, W....34, Dawson Street, Dublin
†Mahon, H. J. P....Strokestown House, Roscommon
McClintock, Major...Hillsborough, Co. Down
Mead, W. R....Ballymartle, Ballinhaseig, Kinsale
Meadows, Joseph...Thornville, Wexford
Naper, James Lenox...Loughcrew, Oldcastle
Owen, Arthur J....Blessington, Wicklow
Owen, William...Blessington
Peake, John...Mullaghmore, Monaghan
Purdon, Edward...Bachelors' Walk, Dublin
Quinn, Peter...The Agency, Newry
Robertson, J....22, La Mancha, Malahide, Dublin
Rutherford, James...40, Eccles Street, Dublin
Slattery, Denis F....Coolnagour, Dungaroon, Waterford
Smith, James...Little Moyle, Carlow
Stawell, Colonel...Kilbrittain, Bandon, Cork
†Stewart, A. J. R....Ards House, Co. Donegal
Sullivan, Rev. J ...Leopardstown, Foxrock, Dublin
Tulbot, George W....Maryborough, Queen's County
†Templemore, Lord...Dunnoby Park, Wexford
†Templetown, Viscount...Castle Upton, Templepatrick, Belfast
†Tighe, Right Hon. W. F...Woodstock Park, Inistioge
†Townshend, C. U....Burlington Road, Dublin
†Trench, Henry...Cangort Park, Roscrea
†Verner, E. Wingfield, M P....The Aske, Bray
Vesey, Lieut.-Colonel....Lucan House, Dublin
Webber, W. Downes...Kellyville, Athy
†Wilbraham, Hugh...Westport, Co. Mayo
†Williams, Francis E....Derreana Lodge, Waterville
Wise, Josias P.. .Rostellan Castle, Cloyne

SCOTLAND.

Governors.

Buccleuch, the Duke of, K.G....Dalkeith House, Edinburgh
†Dunmore, Earl of...Dunmore

Members.

Armstrong, William Jones...Fairlie, Greenock
†Askew, Sir H. Bt....Pallinsburn Ho., Coldstream
†Askew, Watson...Pallinsburn, Coldstream
†Aytoun, R. S....Inchdairnie, Kirkcaldie
Balfour, Colonel David...Balfour Castle, Kirkwall
†Balmer, Thomas...Fochabers
†Beattie, James...Newbie House, Annan
Bethune, Alexander...Blebo, Cupar, Fife
Biscoe, T. P. B....Kingellie Ho., Newton, Inverness
†Bruce, Thomas R....Slogarie, New Galloway Station
Burn, R. S....1, Linkfield, Musselburgh, Edinburgh
†Calverley, C. C....University Club, Edinburgh
†Cathcart, R....Pitcairlie House, Auchtermuchty
Clark, John Moir...Garthdee House, Aberdeen
Cochrane, James...Harburn, Edinburgh
†Duncan, James...Benmore
Elcho, Lord, M.P....Armisfield, Haddington
Finlay, A. K....Castle Toward, Greenock
Finlay, A. S....Castle Toward, Greenock
†Fleming, J. Nicol...Knockdon, Ayrshire
†Grant, Sir G. M. Bart....Ballindalloch Castle
†Guthrie, John...Guthrie Castle, Forfarshire
†Haig, James R....Blairhill, Stirling
†Hamilton, Captain A....Rozelle, Ayr
†Hamilton, John...Sundrum, Ayr
†Hope, A. Peterkin...Boodlands, Noblehouse
†Hutchison, Robert...29, Chester Street, Edinburgh
Kennedy, Rt. Hon. T. F..Dalquharran Castle, Maybole
Kinnaird, Lord...Rossie Priory, Inchture
†Lawson, Charles...George Square, Edinburgh
Learmouth, T. L....Park Hall, Linlithgow
Leith, Alexander...Glenkindie, Inverkindie
Macandrew, Henry C....Midmills, Inverness
MacDouall, James...Smeaton, Prestonkirk
McIlwraith, John...Dunure, Ayr
†MacLagan, Peter...Pumpherstone, Midcalder
†Mather, Myles E....Glen Druidh, Inverness
†Matheson, Sir James, Bart....The Lewes Island
Maxwell, Sir J Heron, Bart ..Springkell, Ecclefechan
†Maxwell, R. C Heron...Springkell, Ecclefechan

†Maxwell, Wellwood H., M.P...Munches, Dalbeattie
Milne, David...Paxton House, Berwick
Mitchell, Andrew...Alloa
Ogilvie, John D....Maidon, Coldstream
†Ogilvy, Lieut.-Col....Millhill, Inchture
Ogilvy, Sir J., Bt....Baldovan House, Dundee
†Orde, Sir J. P. W., Bt..Kilmorey Ho., Loch Gilp Head
Reid, George...Guild Street, Aberdeen
Ronaldson, Peter...South Belton, Dunbar
†Rutherford, George...Printonan, Coldstream
Shield, James, jun....Upper Ravensdowne, Berwick
Shirriff, Samuel D....Saltcoats, Drem
†Smith, George P....Preston, Dunse
†Stables, W. Alexander...Cawdor Castle
†Stewart, Mark John...Ardwell House, Stranraer
†Stirling-Maxwell, Sir W., Bart ...Keir House
†Strathallan, Viscount...Strathallan Castle, Auchterarder
†Taylor, Charles H....Cornhill, Coldstream
†Thompson, Andrew...Berwick-on-Tweed
Turner, John J....2, Montague Street, Edinburgh
Vernon, Hon. Greville R...Auchans Ho., Dundonald
†Welsh, John...Kirkton, Hawick
Wemyss and March, Earl of...Gosford, Longniddry
†White, Henry W....Drumdnan, Forres
Willison, J. P....Maxwelton, Maybole
†Wilson, Professor John...University, Edinburgh
†Wilson, John...Edington Mains, Ayton
†Wood, C. L....Freeland, Bridge of Earn

FOREIGN COUNTRIES.

Members.

†Ahrens, E ...New Schlagsdorf, Mecklenburg
†Amezaga, Camilo...13, Cours du 30 Juillet, Bordeaux, France
†Ananoff, Alexander...Kontais, Russia
†Ananoff, Ivan...Moscow, Russia
†Aranjo, Captain F. J. Da Silva ..Rio de Janeiro
†Bixio, Maurice...26, Rue Jacob, Paris
†Borie, Victor...90, Rue d'Assas, Paris
†Bortier, Monsieur...43, Rue Royal, Brussels
Bowman, J....Victoria, Kansas
Buckland, George.. Toronto, Canada
†Bunsen, G....Bourg-Rheindorf, Bonn
†Cockrane, M. H....Montreal
†Cotta, Baron G....Hipfelhof, Heilbronn
†Dacre, Henry...Auckland, New Zealand
†D'Azy, Count Benoist...88, Rue de Grenelle, Paris
†Decauville, M....Petit Bourg, Corbeil, France
†Decauville, M. Paul...Petit Bourg, Corbeil, France
†De Curzay, Viscount..Chateau de Curzay, Lusignan, France
†De Kergolay, Count...Camisy (Manche), France
Delano, William H ...119, Quai de Valmy, Paris
†De Monicault, E...127, Boulevard Haussman, Paris
†Densy, Ernest...Chateau de la Pacandière, Lucay-le-Mâle (Indre), France
†De Vibraye, Marquis...Chateau de Chaverny (Loir et Cher) France
†De Voguè, Count...37, Rue de Bourgogne, Paris
†De Voguë, Marquis...2, Rue Tabert, Paris
†De Westphalen, Count Clemens ..Laer, Cologne
†Du Buat, Count...Chateau de la Sunardiere (Mayenne) France
†Du Plessis, Gustave...Chateau du Plassi, Mettray (Indre et Loire) France
†Duval, Ferdinand R....16, Place Vendôme, Paris
†Eder, Carl...Hauptgasse, No. 25, Penzing, bei Wien, Austria
†Erkoig, Adolphus...Derekegyhaza, Pesth, Hungary
†Escobar, Alfredo.. Bogata, New Granada, U. S of Columbia
†Ewayama, Naoki...Agricultural Department of Tokai, Japan
†Fries, Count August...Cernahora, Moravia
Giglioli, Italo....Casa Sala, 20, Via Roma, Zorino, Italy
†Grandeau, Louis...Nancy (Meurthe), France
†Heathcote, Lieut.-Col. C....Dharwar, Bombay Presidency
†Hoffschlaeger, J. F....Weisin, bei Mecklenburg
†Holloweg, M. de B....Runorva, Vandsburg, Prussia
†Hopkins, Henry...Newtown Park, Hobart Town, Tasmania
†Jay, John...West 17th Street, New York
†Jobez, Charles...17, Boulevarde Madeleine, Paris
†Jones, A Owen...Maryborough, Queensland
†Lawford, Thomas, jun....London, Canada West
†Le Grande, Emile...Bâle, Switzerland
†Loesch, Heinrich...Cammerswaldau, Prussia
†Lutteroth, Robert...Hamburg
†Lythall, A....Hybenergasse, Prague
†Mangon, Hervé...69, Rue St. Dominique, Paris
†Mannsfeld, Count...Dobrisch, Austria
†Martin, Antoine...Malagnow, Geneva
†Mertens, Baron E... Rue Ducale, Brussels
†Morris, Colonel ..Morrisania, New York
†Nadosy, General...21, Speigelgasse, Vienna
†Nathusius, Baron G....Hundisburg, Alshaldensbleben, Prussia
†Otrante, Count...Nygard, Söderköping, Sweden
Peacock, J. F. B...Howick, Auckland, New Zealand
†Perales, Marquis de...Madrid
Riddock, John...Yallam Park, Penola, S. Australia
Riley, Major, J. E....5, Rue des Capucins, Ostend
†Rivett-Carnac, H....Allahabad, India
†Robinson, William...Madras
†Ronna, Antonio...25, Boulevard Haussmann, Paris
†Savignon, Don Domingo...Mexico
†Schollick, J. S. Fortescue...Australia
†Short, A L. H ..Charinte Grove, Ridgeway, North Carolina
†Sladen, Charles...Geelong, Victoria, Australia
†Smallbones, Paul G. Velm. Gramat, Neusidel, Vienna
†Sverdrup, Thorwald...Fredericksvaern, Norway
†Tachard, Albert...Niedermoschwiller, Dornach (Alsace-Lorraine)
†Thenard, Baron...6, Place St. Sulpice, Paris
†Thomas, G. T....Ermatingen, Switzerland
†Tiersonnier, A....Chateau du Columbier, Nevers
Trehonnais, R F. de la...52, Rue de Courcelles, Paris
†Tucher, Baron August...Nuremberg
†Usedom, The Baron von...Berlin
†Valle, Con de Del...Vergana, Gurpoisea, Spain
†Van Alen, J. J....21, West 27th Street, New York
†Zoeppritz, G....Greshügel, Wurzburg, Bavaria

Members whose Residences are Unknown.

Governors.

†Harcourt, G. Simon
†Tanquerav, John Samuel

Members.

†Abbott, Stephen
†Alderson, John
†Anderson, Alexander
†Astley, Francis L'Estrange
†Baker, Hugh Massey
†Baker, John
†Batson, Thomas
†Beckwith, Thomas P.
Berridge, Thomas
Binney, Charles H.
Blyth, Thomas W.
Boucherette, Henry Robert
†Bretts, Charles
†Burnham, W. H.
†Bush, John W.
Byrd, Frederick
†Cavan, Colonel P. C.
Champney, Felix
Chapman, Captain W. H.
†Charley, Richard
†Clarance, John
Cobb, George Henry
†Cole, Richard John
†Congreve, Walter
†Cooke, W. Fothergill
Cooper, C. B.
†Cotton, Alexander
Critchley, Walter R.
Davies, Robert C.
†Davis, Richard Francis
†De Wezele, Count G.
†Edmonds, F. E.
†Elliott, John
†Farhall, John N.
†Findlay, John
Foster, John
†Foster, John James
†Gammie, George
†Graham, James
†Hall, Henry
†Hall-Dare, F. M.
†Hamond, Nicholas
†Harter, J. Collier
†Henning, James
Henning, W. Lewis
†Hony, Rev. P. F.
Honywood, William
†Kelsall, Henry, jun.
†Kettle, G. Mackenzie
†Louch, F. W. B.
†Lushington, C. Manners.
†Lyall, William
†MacDowall, J. C. S.
†Mackenzie, J. H.
†McLeod, Norman
†Mangles, F.
†Matson, William B.
†Metcalfe, Charles James
†Meyer, P. Herman
†Miles, Grosvenor
†Mumford, William Henry
Page, Joseph
†Parkinson, Thomas
†Penn, Granville J.
†Pocock, Charles
Pulteney, J. G. Beaumont
†Richardson, Robert
†River, John
†Rooper, George
†Simonds, T.
†Smith, John
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